

2009 COMBINED SOUTHERN & MIDDLE SECTIONS PROGRAM

**JANUARY 8-11, 2009
HYATT REGENCY COCONUT POINT RESORT
BONITA SPRINGS, FL**

8th Thursday January

5:00 - Registration - Calusa Foyer
7:00 pm

5:00 - Speaker Ready Room Open - Blue Heron C
7:00 pm

6:00 - Southern and Middle Combined President's Welcome
7:30 pm Reception - Waterfall Pool Deck (Calusa Foyer if inclement weather)

9th Friday January

6:30 am - Speaker Ready Room Open - Blue Heron C
1:00 pm

7:00 - Southern Section Business Meeting (Members Only)
7:50 Great Egret

7:00 am - Registration - Calusa Foyer
5:00 pm

7:15 - Exhibit Hall Open - Calusa D-H
noon

7:15 - Breakfast with Exhibitors
7:50

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

** Denotes Fellow*

8:00 - noon **Scientific Session - Calusa A-C**

8:00 **Welcome and Introduction of President**
Myles L. Pensak, MD*, Cincinnati, OH
Thomas J. Balkany, MD*, Miami, FL
Lauren D. Holinger, MD*, Chicago, IL

8:05 **Presidential Address**
Myles L. Pensak, MD*, Cincinnati, OH

8:20 - 8:35 **Introduction of Southern Section Guest of Honor/Guest of Honor Address**
Unity in Otolaryngology
James C. Denny, MD, Knoxville, TN

8:35 - 8:45 **Introduction of Southern Section Citation Awardees**
Ronald G. Amedee, MD*, New Orleans, LA
Craig Alan Buchman, MD*, Chapel Hill, NC

MODERATOR

Fred F. Telischi, MD*, Miami, FL

8:45 **TRIOLOGICAL SOCIETY THESIS**
DFNB1: Correlation of Genotype with Hearing Profile, Vestibular Function, Labyrinthine Dysplasia and Habilitation
Simon I. Angeli, MD, Miami, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) recognize the clinical presentation of the most common type of childhood hereditary hearing loss, DFNB1; and 2) provide patients and their family members with appropriate counseling regarding chances of recurrence and prognosis.

Objectives: 1) To determine the prevalence of DFNB1 in a cohort of children with prelingual nonsyndromic sensorineural hearing loss; 2) to study phenotype/genotype correlations; and 3) to establish guidelines for genetic counseling of DFNB1. **Study Design:** Prospective cohort study. **Methods:** A total of 119 unrelated children (107 sporadic and 12 familial cases) with prelingual non-syndromic hearing loss underwent mutational screening for DFNB1 in the non-coding and coding exons of *GJB2*, in addition to the del(*GJB6*-D13S1830) mutation of *GJB6*. Information regarding demographics, hearing loss, developmental milestones, inner ear high resolution computed tomography (CT), hearing habilitation, and associated phenotypic manifestations were collected in probands with biallelic pathogenic mutations. **Results:** The prevalence of DFNB1 in cases of prelingual non-syndromic hearing loss was 26% (25% in sporadic and 50% in familial cases). In regards to ethnicity, 19 probands were white and 12 probands of Hispanic ancestry had a mixed racial origin (black, native American, white). Greater genetic heterogeneity was shown with Hispanics of mixed descent exhibiting 10 of 12 *GJB2* allelic variants, while whites had 4 of 10 allelic variants (Fisher exact test, $p=0.033$); both ethnic groups had the *GJB6* deletion. The frequency of deaf carriers of the most commonly found mutation (c.35delG) was 8% and higher than that expected for the general population (Fisher exact test, $p=0.015$). The hearing phenotype was variable in terms of degree of impairment (from mild to profound), onset, symmetry and progression, and there was no correlation with any specific genotype class. DFNB1 probands had normal gross motor development, and the frequency of CT abnormalities of the inner ear was low at 8%. No other specific associated phenotypic manifestations were identified. **Conclusions:** DFNB1 is the most common identifiable etiology of nonsyndromic prelingual deafness both in sporadic and familial cases in this cohort with ethnic diversity. The greater allelic variability observed in Hispanics and the high frequency of deaf probands carrying a single allelic variant of DFNB1 support extending the screening to non-coding regions of *GJB2* and to the remaining DFNB1 locus. Most probands have a congenital hearing loss that is stable, symmetrical and without associated manifestations, but the audiometric profile should not be the only criteria for offering mutational screening of DFNB1 due to the observed variability. These data can be applied to direct the clinical evaluation and effectively counsel families of children with DFNB1.

8:53 **TRIOLOGICAL SOCIETY THESIS**

Surgical Treatment of Obstructive Sleep Apnea Syndrome (OSAS) in Children: Efficacy of Powered Intracapsular Tonsillectomy and Adenoidectomy (PITA) for Treatment of Moderate OSAS

David E. Tunkel, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the benefits of powered intracapsular tonsillectomy and adenoidectomy for children with moderate obstructive sleep apnea.

Objectives: We sought to determine the effectiveness of powered intracapsular tonsillectomy and adenoidectomy (PITA) in the treatment of children with moderately severe obstructive sleep apnea and to measure changes in quality of life that occur with such treatment. **Study Design:** Prospective nonrandomized clinical trial. Setting: Academic pediatric otolaryngology practice. Patients: Convenience sample of children ages 3 to 12 years diagnosed with obstructive sleep apnea of moderate severity, defined as an apnea-hypopnea index (AHI) between 5 and 20 on polysomnography. Children with recurrent streptococcal pharyngitis, chromosomal abnormalities, craniofacial abnormalities, neuromotor disease, sickle cell disease, obesity, or coagulopathy were excluded. Interventions: Surgery with powered intracapsular tonsillectomy and adenoidectomy using the microdebrider. Polysomnography was performed before surgery and repeated 4 to 8 weeks after surgery. OSA-18 questionnaire was completed at surgery and at the time of postoperative polysomnography to assess quality of life changes. Main Outcome Measures: Cure of obstructive sleep apnea, as defined by a postoperative AHI of less than or equal to 1 for complete cure and less than 5 for partial cure. Improvements in quality of life were assessed by changes in OSA-18. **Results:** Nineteen children underwent PITA for moderate OSAS and 14 completed postoperative polysomnography. All 14 subjects who completed the study achieved at least partial cure. Thirteen of 14 (93%) subjects had a complete cure of OSAS after PITA. The median preoperative AHI was 7.9 and the median AHI after surgery was 0.1. The mean number of arousals per hour before surgery was 9.5, and this was reduced to a mean of 5.6 after surgery. Quality of life measures on OSA-18 also improved, with large improvements in total quality of life scores and in all five domains seen after surgery. **Conclusions:** Powered intracapsular tonsillectomy and adenoidectomy cures otherwise healthy children with obstructive sleep apnea of moderate severity, at least in the short-term, as documented by postoperative polysomnography. Improvements in quality of life measures, as documented by changes in OSA-18, were seen in all children as well.

9:01 FIRST PRIZE - SOUTHERN SECTION JAMES A. HARRILL RESIDENT RESEARCH AWARD

Inhibition of Nuclear Factor Kappa B in Organ of Corti Explants Block Dexamethasone Induced Changes in Gene Expression that Protect Against Tumor Necrosis Factor Alpha Induced Ototoxicity

Christine T. Dinh, MD, Miami, FL

Kimberly N. Hoang, BS, Miami, FL

Gia E. Hoosien, BS, Miami, FL

Scott M. Haake, BS, Miami, FL

Thomas J. Balkany, MD*, Miami, FL

Thomas R. Van De Water, PhD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss one pathway that dexamethasone base activates to protect against damage induced apoptosis of tumor necrosis factor alpha challenged organ of Corti explants.

Objectives: Determine the role of nuclear factor kappa-B (NF κ B) in dexamethasone base (DXMb) protection of auditory hair cells from damage induced apoptosis in tumor necrosis factor-alpha (TNF α) challenged organ of Corti (OC) explants. **Study Design:** Basic science, experimental. **Methods:** 108 OC from 3 day old P-3 rats were cultured with either: 1) no treatment; 2) TNF α (2 μ g/ml); 3) TNF α (2 μ g/ml) + DXMb(70 μ g/ml); or 4) TNF α (2 μ g/ml) + DXMb(70 μ g/ml) + NF κ B Inhibitor (NF κ BI) for 0, 24, and 48 hrs. Following mRNA isolation, two step real time PCR was performed using primers for *B-actin*, *Bax*, *Bcl-2*, *Bcl-xl*, and *TNFR1*. Mean fold changes were calculated using the $2^{-\Delta\Delta Ct}$ method. **Results:** TNF α exposed cultures showed increases in expression of proapoptotic *Bax* (24hrs, p=0.007; 48hrs, p=0.017) and receptor *TNFR1* (p=0.019; p=0.036) genes, which were paralleled by an increase in the *Bax/Bcl-2* ratio (p=0.034; p=0.021); there are also significant decreases in the expression levels of *Bcl-2* (48hrs, p=0.001) and *Bcl-xl* genes (48hrs, p=0.007). When OC were treated with TNF α +DXMb, there were significant increases in expression of *Bcl-2* (p=0.0005; p=0.041) and *Bcl-xl* (p=0.006; p=0.008), which were contrasted by a decrease in *Bax* (48hrs, p=0.02) and the *Bax/Bcl-2* ratio (p=0.0004; p=0.01). In TNF α +DXMb+NF κ BI exposed OC, the antiapoptotic effects of DXMb were blocked and the pattern of gene expression was similar to TNF α only exposed cultures. These results were confirmed with hair cell counts. **Conclusions:** DXMb protects against TNF α induced apoptosis of auditory hair cells in rat OC explants through the activation of the NF κ B pathway, which is important in regulating gene expression of antiapoptotic *Bcl-2* and *Bcl-xl*.

9:09 AM-111 Prevents Hearing Loss from Semicircular Canal Injury in Otitis Media

Tyler C. Grindal, MD, Gainesville, FL
Patrick J. Antonelli, MD*, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the mechanism of iatrogenic hearing loss and methods of prevention.

Objectives: Iatrogenic semicircular canal (SC) transection during mastoidectomy for chronic otitis media often leads to profound hearing loss. AM-111, an apoptosis inhibitor, has been shown to mitigate hearing loss when administered after a variety of inner ear injuries. The goal of this study was to determine if round window application of AM-111 following SC transection in the presence of pseudomonas aeruginosa otitis media (PA-OM) may reduce the associated hearing loss. **Study Design:** Prospective, randomized, controlled study in an animal model. **Methods:** PA-OM was induced bilaterally in 34 guinea pigs. After 3 days, both bullae were opened and one lateral SC was transected. AM-111 or vehicle was applied topically to the round window. Hearing was assessed with auditory brainstem responses. **Results:** The mean change in hearing thresholds was significantly less in transected ears treated with AM-111 than those receiving vehicle alone when testing with clicks (22.1 dB vs. 42.5 dB; p=0.019) and at 4kHz (19.7 dB vs. 37.8 dB; p=0.021). 16kHz tone pips showed a similar trend (30.7 dB vs. 46.1 dB; p=0.119). **Conclusions:** AM-111 prevents hearing loss from SC transection in the guinea pig model of PA-OM.

9:17 Lesion Sites in Diabetes Associated Auditory Impairment

Dawn L. Konrad-Martin, PhD, Portland, OR
Donald F. Austin, MD MPH, Portland, OR
Susan E. Griest, MPH, Portland, OR
Daniel J. McDermott, MA, Portland, OR
Stephen A. Fausti, PhD, Portland, OR

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the risk of hearing loss in younger adults with and without diabetes and list potential lesion sites in diabetes associated auditory impairment.

Objectives: This study sought to determine the primary lesion site[s] in diabetes associated auditory impairment. **Study Design:** We employed a cross-sectional method to examine effects of diabetes severity on peripheral, central and cognitive stages of auditory processing in two groups of subjects. **Methods:** Subjects were randomly selected patients with diabetes (152) and without diabetes (152), with no more than about a moderate hearing loss. Age ranged from 26 to 71 years. Diabetes severity in subjects was classified as insulin dependent diabetes mellitus (IDDM), noninsulin dependent diabetes mellitus (NIDDM), or no diabetes. Other diabetes measures included concurrent serum glucose, serum HbA1c, and duration of disease. **Results:** For the youngest tertile only (26-49 years), significant associations were found between diabetes and measures of auditory function, including: hearing sensitivity, cochlear function (stimulus frequency otoacoustic emissions, SFOAEs), and auditory brainstem function (auditory brainstem responses, ABRs). No group differences in cognitive performance were seen. Abnormal hearing sensitivity among diabetic subjects accounted for group differences in ABRs. However, SFOAEs were poorer than expected based on hearing sensitivity among diabetes subjects, consistent with the hypothesis that SFOAEs detect pre-clinical cochlear dysfunction. The diabetes severity index was the best indicator of diabetes associated peripheral auditory dysfunction. **Conclusions:** Results confirm previous reports that diabetes is associated with an increased risk of hearing loss in younger adults. Abnormal auditory brainstem function in IDDM subjects is largely explained by changes in pre-neural (cochlear) function, at least in patients with diabetes and no more than a moderate hearing loss.

9:25 Meta-Analysis of Oral and Plunging Ranulas: What Is the Most Effective Treatment?

Mihir R. Patel, MD, Chapel Hill, NC
Allison M. Deal, MS, Chapel Hill, NC
William W. Shockley, MD*, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to determine which surgical approach and treatment is most effective for treating both oral and plunging ranulas.

Objectives: To determine the most effective surgical management for oral and plunging ranulas. **Study Design:** Retrospective review and metaanalysis. **Methods:** 966 ranula cases were identified after a review of the literature was conducted, comprised of 20 case series that included patients with oral and/or plunging ranulas. A total of 172 reported cases, both oral and plunging, did not comment on complications other than recurrence and were excluded in the final analysis. The data was combined with the series from our institution and the procedures used to treat ranulas were analyzed based on the following categories: recurrence, tongue hypesthesia, Wharton's duct injury, bleeding/ hematoma, post-op infection. Analyses reported are for all ranulas, reports were then separated into two categories: oral ranulas and plunging ranulas. **Results:** The overall complication rate for the various procedures used to treat ranulas ranged from 0% to 81.8%, the most prevalent complication being recur-

rence (9.54%, n = 80) followed by lingual nerve injury (4.1%, n = 34). Recurrence rates were significantly lower in sublingual gland plus ranula excision compared to marsupialization and ranula excision only ($p < 0.0001$, $p = 0.0331$). Removal of the sublingual gland had statistically significant fewer complications than all reviewed treatment modalities (p-value range: 0.0035 - < 0.0001). For both oral and plunging ranulas, the transoral surgical approach to remove the sublingual gland had fewer complications than removal of both the sublingual gland and ranula through an oral or cervical approach ($p = 0.0002$ and < 0.0001 , respectively). **Conclusions:** Definitive treatment for ranulas, both oral and plunging is transoral excision of the ipsilateral sublingual gland with evacuation.

9:33 Q&A

Moderator

Craig Alan Buchman, MD*, Chapel Hill, NC

9:40 **The Enigmatic Trigeminal-Caroticodural Fold: Implications for Exposure Through the Subtemporal Anterior Transpetrosal Corridor**

Myles L. Pensak, MD, Cincinnati, OH*

Jeffrey T. Keller, PhD, Cincinnati, OH

Philip V. Theodosopoulos, MD, Cincinnati, OH

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

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the dural anatomy of the petrous apex and its relationship to the trigeminal nerve and the petrous carotid artery as these structures relate to the anterior transpetrosal surgical corridor.

Objectives: To describe the trigeminal-carotid dural fold (TCF) and its impact on anterior transpetrosal surgical access. **Study Design:** A prospective, nonrandomized analysis of 30 consecutive anterior petrosectomies. **Methods:** Case review of intraoperative findings. **Results:** The trigeminal-carotid dural fold (TCF) is an extension of the dural investment of Meckel's Cave and the trigeminal nerve. The TCF was noted in 26 of 30 cases. These included: meningioma (18), trigeminal schwannoma (9), chondroma (1), chondrosarcoma (1), and a basilar artery aneurysm (1). The TCF was prominent in 18/30 cases, ill defined and wispy in 6/30 cases, and absent in 6 cases. The petrous carotid was dehiscent in 7 cases and partially exposed in 4 cases in the roof of Kawase's space; and a well defined TCF present in 10 of 11 dissections. **Conclusions:** Incision and mobilization of the TCF allows for increased surgical exposure of the anterior-ventral petrous apex and clival region.

9:48 **The Effects of Smoking on Quality of Life Outcomes following Endoscopic Sinus Surgery: Four Year Followup**

Subinoy Das, MD, Columbus, OH

Sunny S. Khichi, BS, Augusta, GA

Helen Perakis, MD, Augusta, GA

Troy Woodard, MD, Augusta, GA

Stilianos E. Kountakis, MD PhD, Augusta, GA*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the changes in SNOT-20 scores following endoscopic sinus surgery in smokers and nonsmokers.

Objectives: The purpose of this study is to report on long term outcomes in a prospective study comparing the quality of life outcomes in smokers and nonsmokers undergoing functional endoscopic sinus surgery. **Study Design:** Prospective clinical trial. **Methods:** A total of 235 patients were prospectively enrolled at a single tertiary academic center. Preoperative SNOT-20 scores and comprehensive demographic and smoking data were obtained. Preoperative SNOT-20 scores were compared to postoperative SNOT-20 scores. **Results:** Long term followup results were available in 111/185 nonsmokers (60%) and 26/50 smokers (52%). Nonsmokers had a mean preoperative SNOT-20 score of 26.2, a short term followup score of 10.1 (mean 3.1 months) and a long term followup score of 11.4 (mean 44.2 months). Smokers had a mean preoperative SNOT-20 score of 27.8, a short term followup score of 5.7 (mean 3.1 months) and a long term followup score of 8.3 (mean 40.3 months). The mean improvement in SNOT-20 scores for smokers was significantly greater than nonsmokers in short term followup ($p = .044$), however no significant difference in improvement was seen between smokers and nonsmokers at long term followup. **Conclusions:** Both smokers and nonsmokers continue to maintain a highly significant improvement in SNOT-20 scores following endoscopic sinus surgery at long term followup. While smoking remains a well documented cause of medical morbidity, smokers maintained an improvement in quality of life after long term followup from endoscopic sinus surgery in this prospective study.

9:56 Selective Endoscopic Decompression of the Orbital Apex for Dysthyroid Optic Neuropathy

Eugene A. Chu, MD, Baltimore, MD
Neil R. Miller, MD, Baltimore, MD
Andrew P. Lane, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the potential benefits and indications for selective endoscopic decompression of the orbital apex for dysthyroid optic neuropathy.

Objectives: To introduce the concept of selective endoscopic decompression of the orbital apex for dysthyroid optic neuropathy and to present surgical outcomes. **Study Design:** Retrospective case series. **Methods:** A retrospective review was performed of urgent endoscopic orbital apex decompressions performed at a tertiary care institution by a single surgeon. Surgical indications consisted of retrobulbar optic neuropathy with radiologic evidence of apical crowding in the setting of Graves' disease. Pre- and postoperative parameters assessed included exophthalmometry, visual acuity, presence or absence of exposure keratitis, diplopia, or an afferent papillary defect, and Ishihara color plate testing. **Results:** In all patients, visual acuity was improved or was stabilized by selective orbital apex decompression. Preoperative afferent papillary defects were reversed in all but one patient. Patients with decreased color vision by Ishihara color plate testing had postoperative improvement in their scores. No patients developed postoperative diplopia. An average of 2.7 mm of ocular recession was achieved. **Conclusions:** Selective decompression of the orbital apex spares the anteromedial and inferior orbital walls that are typically removed in a standard endoscopic orbital decompression. This focused approach successfully addresses compressive optic neuropathy, while minimizing the risk of postoperative diplopia or delayed sinus outflow obstruction. In patients with progressing dysthyroid optic neuropathy without diplopia, significant proptosis, or exposure symptoms, this modified procedure should be considered.

10:04 Cigarette Smoke Condensate Inhibits Transepithelial Chloride Transport and Ciliary Beat Frequency

Noam A. Cohen, MD, Philadelphia, PA
Dawn B. Sharp, MD, Birmingham, AL (Presenter)
Edwin Tamashiro, MD, Philadelphia, PA
Bei Chen, MD, Philadelphia, PA
Shaoyan Zhang, PhD, Birmingham, AL
Eric J. Sorscher, MD, Birmingham, AL
Bradford A. Woodworth, MD, Birmingham, AL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss how cigarette smoke affects components of mucociliary clearance.

Objectives: Although the pathophysiology leading to rhinosinusitis is complex, evidence indicates that decreased mucociliary clearance (MCC) is a major contributing feature. Normal respiratory epithelial MCC is an important host defense mechanism that is dependent on proper ciliary beating and the biological properties of the airway surface liquid (ASL). The role that tobacco smoke exposure plays in inhibiting MCC has yet to be elucidated. The present study investigates the consequences of cigarette smoke exposure on ciliary function and transepithelial chloride (Cl⁻) secretion - a major determinant of ASL. **Study Design:** In vitro investigation. **Methods:** Well characterized primary murine septal epithelial cultures were exposed to cigarette smoke condensate (CSC) and compared to control cultures. Effects on ciliary beat frequency (CBF) and Cl⁻ secretion were investigated using pharmacologic manipulation. **Results:** CSC inhibited augmentation of CBF by isoproterenol and decreased forskolin-stimulated Cl⁻ secretion. CBF (Hz ± SD) was significantly increased following application of isoproterenol from 5.77 ± 2.18 to 15.53 ± 4.07 in control cultures. When incubated with 100 µg/ml of CSE, there was a blunted effect at 1 hour (7.67 ± 0.54 to 11.91 ± 1.12) and complete inhibition at 4 hours (5.42 ± 4.04 to 5.74 ± 3.81). Similarly, forskolin-stimulated Cl⁻ secretion measured in a modified Ussing chamber was decreased approximately 20% when compared to controls. **Conclusions:** The present study provides direct evidence that tobacco smoke diminishes two major components of MCC. This links tobacco smoke as a potential contributing and/or exacerbating factor in exposed individuals with chronic rhinosinusitis.

10:12 Human Papillomavirus Integration in Oropharyngeal Squamous Cell Carcinoma Results in Reversible Upregulation of Beta Catenin

Paul M. Weinberger, MD, Augusta, GA
Hans T. Carlson, BS, Augusta, GA (Presenter)
Edward C. Goodwin, PhD, New Haven, CT
Panteleimon Kountourakis, MD, New Haven, CT
Amanda Psyrris, MD, New Haven, CT

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss common events in HPV related cancer progression, including viral integration, and relate this to possible novel therapeutic measures for treatment of HPV related head and neck cancer.

Objectives: To determine molecular changes associated with human papillomavirus (HPV) integration in oropharyngeal squamous cell carcinoma (OSCC). **Study Design:** Laboratory based study of 48 patients with PCR proven HPV16+ OSCC treated at a tertiary academic medical center. **Methods:** HPV16 positivity was determined by quantitative real time PCR (qPCR) using primers specific for HPV16E6. Viral integration was determined using loss of HPVE2 as a surrogate marker. HPV16E2 was measured quantitatively using qPCR for HPV16E2. Integration was defined as E2/E6 ratio <1.0. Protein expression for beta catenin, c-met, VEGF, and EGFR were determined quantitatively by fluorescent immunohistochemistry tissue microarray. Stable cell cultures of HPV18+ Hela cells were transfected with E2 protein. Protein expression pre- and post-E2 transfection was compared by western blot. **Results:** Forty-eight patients with HPV16+ OSCC were identified. There were 38 males and 10 females. Patients were TNM stage 4 (54%), stage 3 (40%), and stage 2 (6%). Twenty-two patients were classified as primarily episomal (E2/E6 >1) and 23 as primarily integrated (E2/E6<1). There was no association between viral integration and c-met, VEGF and EGFR expression. Patients with viral integration demonstrated elevated beta catenin expression. HPV18+ Hela cells demonstrated high beta catenin expression. Transfection of E2 resulted in repression of beta catenin in this cell culture model. **Conclusions:** Integration of HPV occurs in some OSCCs and is associated with elevated beta catenin expression. In a cell culture model, transfection of HPV E2 resulted in repression of beta catenin expression. Delivery of E2 protein may represent a potential novel molecular therapy for HPV associated OSCC.

10:20 Q&A

10:28 Break with Exhibitors/Poster Viewing - Calusa D-H

11:00 - PANEL: IMPLANTABLE DEVICES

12:00 Moderator: Fred F. Telischi, MD*, Miami, FL

Panelists: Alan G. Micco, MD*, Chicago, IL
Thomas J. Balkany, MD*, Miami, FL
Peter C. Weber, MD*, Cleveland, OH
David S. Haynes, MD*, Nashville, TN
Jack J. Wazen, MD*, Sarasota, FL

noon Adjourn

12:30 Southern & Middle Golf and Tennis Tournaments

6:30 - Southern & Middle Meet the Authors Poster

8:00 pm Reception - Calusa D-H

10th Saturday January

6:30 am - Speaker Ready Room Open - Blue Heron C

2:00 pm

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

7:50 Pine

Middle Section Business Meeting (Members Only) - Great Egret

7:00 am - Registration - Calusa Foyer

5:00 pm

7:15 - Exhibit Hall Open - Calusa D-H

12:30

7:15 - **Breakfast with Exhibitors**
7:50

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

8:00 - **Scientific Session - Calusa A-C**
2:00

8:00 **Welcome/Announcements by Vice Presidents**
Thomas J. Balkany, MD*, Miami, FL
Lauren D. Holinger, MD*, Chicago, IL

8:05 - **Introduction of Middle Section Guest of Honor/Guest**
8:20 **of Honor Address**
What the Triological Society Has Meant to Me
Jack L. Gluckman, MD*, Cincinnati, OH

8:20 - **Introduction of Middle Section Citation Awardees**
8:30 Edward L. Applebaum, MD*, Chicago, IL
Rodney P. Lusk, MD*, Omaha, NE

8:30 **Introduction of George Adams, MD, Young Faculty Award Winners**
David R. Friedland, MD PhD, Milwaukee, WI
John S. Rhee, MD MPH*, Milwaukee, WI

8:35 - **Recognition of New Candidates for Fellowship**
8:50 **Recognition of Triological Society Grant Awardees**
Abraham Jacob, MD, Columbus, OH
Carol Bier-Laning, MD, Maywood, IL
Michael Kupferman, MD, Houston, TX
Kenneth Lee, MD, Dallas, TX

Recognition of Resident Research Award Recipients

Southern Section:

Christine T. Dinh, MD, Miami, FL
Jeremy B. White, MD, Washington, DC
Eric M. Jaryszak, MD PhD, Gainesville, FL
Mihir R. Patel, MD, Chapel Hill, NC

Middle Section:

Eric Kenneth Meen, MD, Winnipeg, MB Canada
David G. Lott, MD, Cleveland, OH
Clementino Arturo Solares, MD, Cleveland, OH

Recognition of Poster Award Winners

Moderator

Alan G. Micco, MD*, Chicago, IL

8:50 **TRIOLOGICAL SOCIETY THESIS**
Differential Gene Expression in the Kreisler Inner Ear
Daniel I. Choo, MD, Cincinnati, OH*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the concept of large scale genome screening using microarrays; and 2) identify and discuss the possible roles of specific candidate genes that guide inner ear development.

Objectives: Using a mutant mouse model of the developing inner ear, this study will test the hypothesis that mutation of the *kr/mafB* gene results in altered expression of key developmental genes that, in turn, result in the inner ear malformations observed in *kreisler* mutants. An additional objective is to test the validity and utility of array-based experiments in identifying additional candidate genes for further research in this *kr/mafB* molecular pathway. **Study Design:** Microarray, RT-PCR, in situ hybridization and immunohistochemical studies were all performed utilizing developmental stage-matched *kreisler* and wild-type control inner ear samples. Microarray experiments were analyzed using a Student's T-test to determine the significance of changes in gene expression levels. For morphologic experiments, at least 4 experiments were conducted for each probe or antibody used at each developmental time point. **Methods:** Total RNA was harvested from *kreisler* and matched control otocysts at embryonic day 10 and embryonic day 15 inner ears for array-based. Array experiments were conducted using standard commercially available fluorescently-labeling kits, microarrays and chip reading platforms (Affymetrix, Santa Clara, CA). Genes that were differentially regulated and significantly different in *kreisler* compared to control embryos were then examined by varying combinations of RT-PCR, in situ hybridization and immunohistochemistry. Both in situ hybridization and immunohistochemical experiments were conducted on frozen or paraffin sections of the inner ear at the two described developmental timepoints. **Results:** At an early developmental stage (embryonic day 10), *Nkx6.2* and *Ngn1* were significantly upregulated in *kreisler* mutants compared to controls. In contrast, *Wnt6*, *Msx2*, *Aldh1a1* and *Gbx2* were all downregulated significantly, as shown by microarray experiments at this same early embryonic time point. These data were all corroborated by one or more alternative gene expression assays (RT-PCR, in situ hybridization or immunohistochemistry). At embryonic day 15, array experiments identified *Gpc3*, *Smad5*, *Foxa1* and *Krt2-17* as all being upregulated in *kreisler* mutants compared to controls. *Gata3* was notably downregulated in mutant inner ears. Corroborating expression data were generated for *Smad5*, *Foxa1*, *Krt2-17* and *Gata3* that were consistent with the array data. Data for *Gpc3* were not available to either support or refute the microarray results. **Conclusions:** For the limited battery of genes examined by multiple expression assays in this study (microarray, RT-PCR, in situ hybridization and immunohistochemical techniques), the data consistently support the validity of properly conducted microarray experiments in identifying genes that are differentially expressed *kreisler* vs control inner ears. Furthermore, the experimental data now identify several developmentally important genes that are involved in the *kr/mafB* pathway that helps guide normal inner ear morphogenesis. These genes (such as *Wnt6*, *Krt2-17*, *Ngn1*, *Foxa1*, *Smad5*, *Nkx6.2*, and *Aldh1a1*) now represent the next battery of candidates for continuing studies. Defining their epistatic relationships and functions in the *kr/mafB* pathway will help complete more of the picture with respect to this pathway and help elucidate the complex genetic interactions that are likely responsible for guiding the morphogenesis of a normal inner ear as well as the abnormal phenotype observed in *kreisler* mice.

8:58 TRIOLOGICAL SOCIETY THESIS
A Functional and Histological Comparison of Acellular Dermal Matrix and Split Thickness Skin Grafts for Oral Cavity Reconstruction
Douglas A. Girod, MD, Kansas City, KS*

Educational Objective: At the conclusion of this presentation, the participant should be able to describe the advantages and disadvantages of using acellular dermis or split thickness skin grafts for oral cavity reconstruction based on healing rates, functional outcomes, histology and cost.

Objectives: To compare the efficacy of acellular dermal matrix (ADM) and split thickness skin grafts (STSG) in oral cavity reconstruction. **Study Design:** An institutional review board and human subjects committee approved prospective cohort study at a tertiary medical center. **Methods:** Thirty-four patients were identified for inclusion in this study. Twenty-two patients received ADM grafting and twelve patients received STSG. All patients underwent evaluation for patient demographics, grafting site and size, graft success rate, graft contracture, and functional status as defined by the EORTC QLQ-C30 and the H&N35 questionnaires. A subgroup of patients underwent biopsy of the grafted site for histological analysis. A cost estimate of each procedure (ADM and STSG) was also performed for comparison. **Results:** The most common oral cavity site grafted was the tongue and floor of mouth. The patient groups were similar in age, sex, race, and smoking exposure. There were three times more patients treated with radiation therapy (pre- or post-op) in the ADM group (45%) compared to the STSG group (17%). Mean time of followup was 24 months for ADM and 17 months for STSG. Graft failure rate was higher in the ADM group (14% versus 0%) and both had similar amounts of estimated graft contraction. The quality of life survey results trended to favor the ADM group but only the category of "trouble with social eating" reached statistical significance (p=0.03). Radiation therapy had a significantly negative impact on pain, swallow, mouth opening and saliva for both ADM and STSG. Histology demonstrated thickened epithelium in both groups with increased inflammation, fibrosis and elastic fibers in the STSG group. The cost of the STSG was 3.5 times more than the ADM group. **Conclusions:** The use of ADM for the reconstruction of full thickness oral cavity defects offers several advantages over traditional STSG including the lack of donor site morbidity, shortened operating time, lower cost and a natural appearing mucosal surface. Functional status determined by the QOL measures tended to favor the ADM group. Lower graft take rates with ADM warrants caution, however this was in the setting of prior radiation and with

thicker ADM grafts than are currently available.

9:06 Topical Dexamethasone and Tympanic Membrane Perforation Healing in Otitis Media

Patrick J. Antonelli, MD, Gainesville, FL*
Gregory S. Schultz, PhD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the potential impact of ototopical steroid preparations on tympanic membrane perforations.

Objectives: Topical antibiotics, either alone or combined with corticosteroids, are often used to treat acute otitis media (AOM) with tympanic membrane perforation (TMP). Most TMPs due to AOM heal without sequelae; however, steroids may impair wound healing. The purpose of this study was to determine whether topical application of ciprofloxacin (cipro) combined with dexamethasone (dex) suspension impairs AOM related TMP healing relative to treatment with cipro, alone, in an animal model.

Study Design: Controlled trial in an animal model. **Methods:** Bilateral AOM was induced in chinchillas by trans bulla injection of streptococcus pneumoniae, and TMs were perforated with a CO2 laser 3—5 days later. Each animal received cipro-dex in one ear and cipro in the other, twice daily for 7 days. TMs were assessed for 4 weeks. **Results:** 15 of 55 cipro and 37 of 55 cipro-dex treated TMs failed to heal within the 4 week study period (27% vs 67%, $p < 0.001$). At 4 weeks, mean TMP size was 0.9mm² in cipro ears and 2.1 mm² in cipro-dex ears ($p < 0.001$). **Conclusions:** Topical dexamethasone impairs tympanic membrane healing in a chinchilla model of acute otitis media.

9:14 FIRST PRIZE - MIDDLE SECTION DEAN M. LIERLE RESIDENT RESEARCH AWARD
Exploiting the Blood Labyrinth Barrier toward Treatment for Sensorineural Hearing Loss

Eric Kenneth Meen, MD, Winnipeg, MB Canada
Brian W. Blakley, MD PhD, Winnipeg, MB Canada*
Taeed K. Quddusi, MD, Winnipeg, MB Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the possibility of using a neurotrophin to improve hearing.

Objectives: 1) To present early data on the use of brain-derived nerve growth factor (BDNF) of treatment of sensorineural hearing loss in guinea pigs; and 2) to discuss the practical applicability of our method to humans. **Study Design:** Controlled animal research study. **Methods:** Hearing loss was created using high doses of cisplatin in eleven guinea pigs. One month later, bilateral cochleostomies were then performed and in one ear brain-derived nerve growth factor (BDNF) was injected prior to plugging with fat. Auditory brainstem response (ABR) testing was then carried out for three months at 6000, 8000, 12000 and 24000 Hz. **Results:** Auditory thresholds were better in the treated ear for all frequencies. Threshold differences ranged from 2 to 27 dB and were statistically significantly better 2 months after treatment (General Linear Model, repeated measures $p=0.045$).

Conclusions: This is the first paper that we are aware of for which a treatment induced a difference in established hearing using a method that could be used in humans. Further refinements are needed, but we hope that these preliminary results will lead to a treatment for sensorineural hearing loss.

9:22 Tracking the Otolaryngology Curriculum: Do We Teach What We Say We Teach?

Christine B. Franzese, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the educational curriculum requirements of the ACGME Otolaryngology Program Requirements, to understand prospective didactic lecture tracking and the impact of educational subject coverage on Intraining Examination Scores, and to demonstrate understanding of the recently released Otolaryngology Core Curriculum from the American Board of Otolaryngology, which is mirrored by the ACGME Program Information Form.

Objectives: Otolaryngology residency programs are required to provide didactics in all areas defined in the Program Requirements. Tracking of didactic curricula is done by reporting conference subjects on Program Information Forms. However, this is done retrospectively and does not ensure all subjects are adequately covered. A method of prospectively tracking didactic topics is needed to ensure all subject areas are covered and remain relevant. **Study Design:** Prospective. **Methods:** Didactic lecture subjects were tracked over a two year period using an electronic tracking form created from the Otolaryngology curriculum for our program. The form was sent out monthly to faculty with a copy of the previous conference schedule. Faculty were asked to check off subjects covered in lectures. Comparison to program Intraining Examination Scores were made. **Results:** Overall 81.5% of the curriculum subjects were actually covered. Coverage varied by section. “Head and Neck” and “Sinonasal Disorders” received the most coverage at 94% each. “Facial Plastic Surgery” and “General Otolaryngology” received the least coverage at 66% and 67%, respectively. Three topics were deleted as either outdated or redundant and 12 new top-

ics were added. Coverage was compared to Intraining Examination Scores, with "General Otolaryngology" receiving the lowest scaled program scores. **Conclusions:** Despite active monitoring and reminders, all topics were not covered on the curriculum and seemed to impact Intraining Scores. Reasons for this varied. Tracking subjects did make adding and deleting topics easier. The current tracking form has been modified to correspond to the Otolaryngology Curriculum released by the American Board of Otolaryngology.

9:30 Update on Endoscopic Management of Lingual Thyroglossal Duct Cysts

Collin M. Burkart, MD, Cincinnati, OH
Gresham T. Richter, MD, Cincinnati, OH
Michael J. Rutter, FRACS, Cincinnati, OH
Charles M. Myer, MD, Cincinnati, OH*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the incidence, clinical features, and surgical management of lingual thyroglossal duct cysts in pediatric patients.

Objectives: Thyroglossal duct cysts (TGDC) are uncommon congenital midline neck masses arising from tubal remnants of embryologic thyroid descent. A rare variant of TGDC can present in the central tongue base and is appropriately named "lingual" TGDC (LTGDC). Left untreated, LTGDC may present with life threatening airway obstruction. TGDC require surgery for cure; however, the surgical approach to LTGDC has not been discussed fully. This study was designed to examine the incidence, clinical features, and surgical management of LTGDC. **Study Design:** Retrospective chart review. **Methods:** Retrospective chart review of patients from a pediatric tertiary care institution diagnosed with lingual TGDC from 1997-2008. **Results:** 189 patients underwent surgical excision of TGDC, of which 16 (8.5%, mean age=3 yr) presented with lingual TGDC alone. Most lingual TGDC were discovered incidentally though 7 patients (44%) presented with moderate to severe upper airway obstruction. Endoscopic transoral excision was performed in each case. This included suspension laryngoscopy with electrocautery, electrocautery and cold dissection, or a combination of microdebridement and electrocautery. Most patients were electively intubated overnight for airway protection. All patients recovered without complication and have shown no evidence of recurrence (median F/U = 3.7 year). Two LTGDC cases were revisions of prior surgeries (marsupialization and an open procedure) performed at outside hospitals. **Conclusions:** Although rare, LTGDCs frequently present as a prominent tongue base mass with the potential of life threatening airway obstruction. Herein we described the typical presentation, workup, and ideal surgical approach of these lesions. Complete surgical extirpation can be performed successfully with endoscopic techniques and minimal risk of complication or recurrence.

9:38 Pseudomonas Aeruginosa Infection results in More Aggressive Cholesteatomas with Greater Morbidity in a Gerbil Model

Dong H. Lee, BS, St. Louis, MO
Robert Nason, MD, St. Louis, MO
Eric W. Wang, MD, St. Louis, MO
Jae Y. Jung, MD PhD, St. Louis, MO
Richard A. Chole, MD, St. Louis, MO*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current knowledge of cholesteatoma pathogenesis and evidence for the etiological role of PA infection.

Objectives: Clinicians have long noted that infected cholesteatomas are more aggressive than uninfected ones. However, there is a paucity of data to support these observations. The purpose of this study is to determine the etiological role of pseudomonas aeruginosa in the pathogenesis of cholesteatoma using a gerbil model. **Study Design:** We evaluated three different PA strains in the progression of cholesteatomas: PA14, a well characterized wound isolate, OPPA8, an otopathogenic strain isolated from a human cholesteatoma and OPPA8-NP, an isogenic type IV pili deletion mutant. **Methods:** Experimental cholesteatomas were induced in gerbils by ear canal ligation. Prior to ear canal ligation, we inoculated the right canal with bacteria and the left canal with PBS. After 6 weeks their cholesteatomas were evaluated by micro-CT. Cholesteatoma size, bone resorption and reactive bone resorption were analyzed digitally. **Results:** Results demonstrate that PA infection increases cholesteatoma size when compared to uninfected controls: OPPA8-NP showed a twofold increase, PA14 a threefold and OPPA8 a ninefold increase. Additionally, infected bullae showed 10 to 50% more bone resorption near the cholesteatoma and reactive new bone formation was increased 40 to 90%. **Conclusions:** In a gerbil model, PA infected cholesteatomas enlarge more rapidly and are more destructive than uninfected controls. OPPA8, the strain isolated from a human cholesteatoma, showed the greatest enlargement and bone destruction. Additionally, we demonstrate that type IV pili are an important virulence factor in this model since the non-piliated isogenic mutant, OPPA8-NP, was significantly less aggressive than the wild-type, OPPA8.

9:46 Q&A

**9:50 - PANEL: CURRENT SURGICAL TREATMENT OPTIONS
10:40 IN THE MANAGEMENT OF CHRONIC FRONTAL RHINOSINUSITIS**

Moderator: *Robert C. Kern, MD*, Chicago, IL*

Panelists: *Rakesh K. Chandra, MD, Chicago, IL*
Roy R. Casiano, MD, Miami, FL*
Stilianos E. Kountakis, MD PhD, Augusta, GA*
James A. Stankiewicz, MD, Maywood, IL

10:40 Break with Exhibitors/Poster Viewing - Calusa D-H

11:10 Office Imaging: How to Get it Going
David B. Conley, MD, Chicago, IL

11:35 Q&A

Moderator

Robert C. Kern, MD*, Chicago, IL

11:40 Cartilage Grafts in Dorsal Nasal Augmentation of Traumatic Saddle Nose Deformity, a Long Term Followup

Johnny C. Mao, MD, Detroit, MI
Senja A. Tomovic, MD, Detroit, MI
Michael A. Carron, MD, Detroit, MI
Kailash A. Narasimhan, MD, Detroit, MI
Robert H. Mathog, MD, Detroit, MI*

Educational Objective: At the conclusion of this presentation, the participants should be able to explain how the cartilage grafts are harvested and deployed, and to discuss the advantages and disadvantages of this type of cartilage graft in correction of traumatic saddle nose deformity.

Objectives: To document the long term advantages and disadvantages of cartilage grafts to correct traumatic saddle nose deformity. Additionally, to demonstrate functional improvement and cosmetic satisfaction with the use of this graft. **Study Design:** Retrospective chart review and prospective followup telephone survey of 20 patients after dorsal augmentation of saddle nose deformity secondary to trauma. **Methods:** This is a single surgeon, single institution investigation within an academic, tertiary care medical center. All patients presented for correction of saddle nose deformity after trauma and cartilage grafts were used for augmentation of the dorsum. A modified and expanded Nasal Obstructive Symptoms Evaluation (NOSE) survey which included questions pertaining to the appearance of their nose was used to assess both functional and cosmetic changes after surgery. **Results:** None of the 20 patients were dissatisfied with the overall outcome. Three (15%) were extremely satisfied, twelve (60%) were very satisfied, four (20%) were somewhat satisfied, and one (5%) was indifferent. In terms of function, four (20%) experienced excellent relief in nasal obstruction, five (25%) moderate relief, four (20%) mild relief, and seven (35%) noted no difference. Regarding cosmesis, two (10%) noted excellent improvement, three (15%) moderate improvement, nine (45%) mild improvement, five (25%) noted no significant change. One (5%) patient reported worsening due to tip edema. Mean followup time was 8.1 years. **Conclusions:** Autologous cartilage grafts are useful in the correction of traumatic saddle nose deformity. The graft is readily available, preserves long term structural stability, and achieves functional and cosmetic satisfaction in most patients.

11:48 Beware the Nasal Pit

John J. Christophel, MD, Charlottesville, VA
Andrew D. Beckler, BS, Charlottesville, VA
Stephen S. Park, MD, Charlottesville, VA*

Educational Objective: At the conclusion of this presentation, the participants should be able to appropriately evaluate patients with nasal dermoids, determine need for craniotomy and appropriate surgical approach.

Objectives: Of congenital nasal masses, nasal dermoids are most frequently encountered, but also misdiagnosed as cutaneous pits limited to the skin. In this review, we describe the diagnosis and management of congenital dermoids, emphasizing

a thorough preoperative radiographic evaluation to determine the necessary surgical approach. We also describe surgical options, outcomes, and factors associated with the need for craniotomy. **Study Design:** Retrospective chart review of patients treated at a tertiary care academic medical from 1999 to 2007. **Methods:** 17 patients met the criteria for dermoid of the head and neck treated by the otolaryngology service. Patients were evaluated by method of excision of cutaneous portion, location of lesion, intracranial extension on imaging, intracranial extension at surgery, presenting symptoms, and previous attempts. These factors were correlated with need for craniotomy. **Results:** 17 patients with congenital dermoids underwent 17 operations. The mean age was 9 years and ranged from 1 to 39. Three patients had previous attempts at excision at outside institutions. Cases which required craniotomy (35%) were associated with intracranial extension or dural involvement, as seen on preoperative imaging. No other demographic factor or exam finding correlated with need for craniotomy. There have been no recurrences. **Conclusions:** Nasal dermoids often present as small, benign appearing lesions of the nose. A high percentage of these masses are associated with extension towards the skull base, and failing to recognize this by appropriate preoperative evaluation can lead to incomplete excision, recurrence, and patient dissatisfaction.

11:56 Histologic Evaluation of Microendoscopy of Reinke's Space in Cadaveric Human Larynges

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

Jonathan M. Bock, MD, Nashville, TN

Douglas J. Van Daele, MD, Iowa City, IA

Jan S. Ahlrichs-Hanson, BSN CNOR, Iowa City, IA

Educational Objective: At the conclusion of this presentation the participants should be able to identify the gross and microscopic anatomic changes that acutely occur in the subepithelial endoscopic surgical approach to Reinke's space.

Objectives: To identify the acute changes that occur in the process of microendoscopy of Reinke's space through an external endoscopic approach with injection of filler substances (Radiesse voice gel (R)). **Study Design:** Male and female adult human cadaveric larynges were evaluated grossly and microscopically through coronal whole mount sections after surgical treatment of Reinke's space. **Methods:** Micro-CO2-laser dissection of Reinke's space was performed through an external approach with microendoscopic guidance followed by injection of Radiesse voice gel (R). The larynges were fixed in formalin, decalcified, embedded in celloidin and cut into 30 - 35 um sections with hematoxylin and eosin staining. **Results:** The vocal fold epithelium was successfully separated from the underlying vocal ligament with retention of intervening injectate. Diffusion of the Radiesse phonogel through adjacent muscle fibers, the paraglottic space, and supraglottis was observed. **Conclusions:** This anatomic study of microendoscopy of Reinke's space supports its use to address scarring, sulcus vocalis, and other intracordal processes. Further study is needed to identify optimal materials to position in the dissected region to facilitate appropriate healing.

12:04 Use of the Forehead Flap for Nasal Reconstruction

Brian B. Hughley, BA, Charlottesville, VA

Stewart C. Little, MD, Shreveport, LA

Stephen S. Park, MD, Charlottesville, VA*

Educational Objective: At the conclusion of this presentation, participants should be able to demonstrate proper clinical indications for the forehead flap. Participants should also be able to discuss complications associated with the forehead flap and various comorbidities that may be associated with them.

Objectives: To review outcomes (at one academic tertiary care center) from the repair of large or complex nasal defects using the forehead flap. **Study Design:** Retrospective chart review (1997-2007). **Methods:** Main outcome measures are complications related to surgery and their correlation with patient comorbidities. Complications were categorized as major (flap necrosis, notching, and complete obstruction) or minor (epidermolysis, infection, mild collapse, retraction). **Results:** 162 patients were treated for nasal defects using forehead flaps (142 midline forehead flaps (88%), 20 paramedian forehead flaps (12%)). Cartilage grafting was used in 119 cases (73%). Forty-seven patients (29%) had full thickness defects requiring repair of the internal lining. Of the total group of 162 patients, major complications were noted in 28 (17%) and minor in 52 (32%). A higher rate of major complications (36%) was observed in patients with full thickness defects versus skin only defects. No patients required a second flap to address complications, and revision surgery was performed for 11 patients (7%). **Conclusions:** Nasal reconstruction utilizing the forehead flap yields excellent functional and cosmetic results, even with complex nasal defects. Special attention should be given to patients with full thickness defects, as there is a greatly increased risk of complications in this group.

12:12 Q&A

12:20 Break/Snack

12:45 - 2:15 **PANEL: OFFICE TREATMENTS IN OTOLARYNGOLOGY**

Moderator: *Cliff A. Megerian, MD*, Cleveland, OH (Otology)*
Panelists: *Douglas M. Sidle, MD, Chicago, IL (Facial Plastics)*
Donald T. Weed, MD, Miami, FL (Head & Neck)*
William Giles, MD, Columbia, SC (Pediatrics)*
C. Gaelyn Garrett, MD, Nashville, TN (Laryngology)*
Roy R. Casiano, MD, Miami, FL (Sinus)*

2:15 **Adjourn**

2:20 - 4:00 **Triological Society Thesis Seminar - Open to Candidates, Potential Candidates and Members (Non-Credit Seminar) - Great Egret**

11th Sunday January

6:30 - 11:00 am **Speaker Ready Room Open - Blue Heron C**

7:00 - 7:50 **Middle Section Business Meeting (Members Only) - Great Egret**

7:00 - 11:00 am **Registration - Calusa Foyer**

7:15 - 11:00 am **Exhibit Hall Open - Calusa D-H**

7:15 - 7:50 **Breakfast with Exhibitors**

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

8:00 - 11:20 **Scientific Session - Calusa A-C**

7:55 **Welcome/Announcements by Vice Presidents**
Thomas J. Balkany, MD, Miami, FL*
Lauren D. Holinger, MD, Chicago, IL*

Moderator
William Giles, MD*, Columbia, SC

8:00 **Surgical Causes of Failure in Revision Endoscopic Sinus Surgery in Children**
Hassan H. Ramadan, MD MSc, Morgantown, WV*

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the most common causes of surgical failure after ESS in children.

Objectives: Revision ESS in children is not very common. Causes of failure however are not very well delineated. The purpose of this study was to evaluate surgical causes of failure in children after ESS. **Study Design:** A retrospective review of children who had ESS at a tertiary children's referral center between 1993 and 2005 for chronic rhinosinusitis was performed. **Methods:** 243 children had ESS. Children with cystic fibrosis, immune deficiency/suppression, and ciliary abnormalities were excluded because the reasons of failure in those children are well known. Data was available on 176 children with at least one year of followup. **Results:** Twenty-three (13%) children required revision ESS. The most common finding was adhesions in 57%, followed by maxillary sinus ostium stenosis or missed maxillary sinus ostium in 52% of the cases. In 39% of the cases, there was recurrent disease in the sinuses that were operated on initially. Interestingly however, we found that in 26% surgery was needed because of disease that was present in non-operated sinuses during the primary ESS. A deviated septum and a mucocele were the cause of failure in 17% and 13% of the patients. Presence of asthma and younger age contributed to the failure in some of these children. **Conclusions:** Adhesions and scarred narrow maxillary sinus ostium were the most common cause of failure in children after ESS. Steps taken during surgery may be required to help reduce the need for revision in particular for younger asthmatic children.

8:08 Leech Transmitted Ciprofloxacin Resistant *Aeromonas Hydrophila*

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

David K. Warren, MD MPH, St. Louis, MO

Vicky M. Ferris, RN CIC, St. Louis, MO

Brian Nussenbaum, MD, St. Louis, MO*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand that leech transmitted *Aeromonas* may be resistant to ciprofloxacin and trimethoprim/sulfamethoxazole with or without antibiotic selection; 2) consider ciprofloxacin and trimethoprim/sulfamethoxazole resistance in *Aeromonas* prophylaxis when using medicinal leeches; and 3) understand the practice and systems based investigation of a novel nosocomial infection.

Objectives: Ciprofloxacin and trimethoprim/sulfamethoxazole are the standard of care antibiotics used to prevent *Aeromonas* infections when utilizing leech therapy for congested flaps. A sentinel nosocomial infection of *A. hydrophila* that was resistant to both of these antimicrobials occurred after treatment of an osteocutaneous free flap with medicinal leeches. The resulting *Aeromonas* infection caused myonecrosis and subsequent total flap loss. An infection control investigation was conducted to determine the source of this resistant *Aeromonas* strain. **Study Design:** Infection control investigation. **Methods:** The investigation systematically examined local bacterial exposures through cultures and sensitivities, national reports of *Aeromonas* infections, the leech farm conditions, and screening of the leech supplier. **Results:** The infecting strain of *A. hydrophila* was resistant to ciprofloxacin and trimethoprim/sulfamethoxazole. Perioperatively, the patient was only exposed to ciprofloxacin and Unasyn. Cultures of the hospital's leech environment yielded *Aeromonas* species that were universally sensitive to ciprofloxacin. No other leech transmitted ciprofloxacin resistant *Aeromonas* infections have been reported within our hospital or in the CDC database. The leech supplier does not perform routine antibiotic screening of the *A. hydrophila* in their leeches. **Conclusions:** Ciprofloxacin and trimethoprim/sulfamethoxazole resistant strains of *Aeromonas hydrophila* exist and can be transmitted by leech therapy with devastating consequences. Both a practice and systems based investigation of the sentinel infection suggested that the ciprofloxacin resistant *A. hydrophila* strain was present in the leech at the source facility. However, ciprofloxacin prophylaxis may have selected for the resistant strain in this patient. Decisions regarding choice of antibiotic prophylaxis for *A. hydrophila* during leech therapy should consider the selection for ciprofloxacin resistant strains.

8:16 Quality of Life in Patients with Chronic Rhinosinusitis and Obstructive Sleep Apnea

Troy D. Woodard, MD, Augusta, GA

Helen A. Perakis, MD, Augusta, GA

Stilianos E. Kountakis, MD PhD, Augusta, GA*

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that other non-rhinologic illness may cause elevated SNOT-20 scores and recognize the need to have additional objective data to confirm a diagnosis of chronic rhinosinusitis.

Objectives: The Sino-Nasal Outcome Test (SNOT-20) is a disease specific quality of life (QOL) instrument that is used in patients with rhinosinusitis. However, patients with non-rhinologic illnesses may have elevated scores. Our goal was to compare QOL outcomes in patients with chronic rhinosinusitis (CRS) and obstructive sleep apnea (OSA). **Study Design:** Retrospective analysis of prospectively collected data. **Methods:** Patients with CRS and OSA in a tertiary care facility were identified. Pre-treatment symptom scores were measured using the SNOT-20 instrument and objective findings were measured using the Lund-Kennedy endoscopy scoring system. Scores and the patterns of distribution of symptoms were compared. **Results:** 57 patients with CRS and 65 patients with OSA were identified. Both groups had elevated mean total SNOT scores, (28.7 +/- 12.2, CRS patients and 29.7 +/- 10.7, OSA patients). Although the total scores were almost the same for both groups, OSA patients reported higher symptom scores in the overall wellness portion of the instrument, such as poor sleep, fatigue,

decreased productivity and concentration, sadness, and embarrassment. The CRS patients had higher scores in the sinonasal portion of the SNOT-20. CRS patients had significant higher endoscopy scores compared to OSA patients (6.6 vs. 0.46, respectively, $p=2 \times 10^{-18}$). **Conclusions:** While CRS and OSA were associated with elevated total SNOT-20 scores, there was a significant difference in the pattern of distribution of symptoms between the patient groups. This study demonstrates that other disorders can cause elevated scores and confirms the Sinus and Allergy Health Partnership's recommendation to have additional objective data to confirm a diagnosis of CRS.

8:24 Efficacy of Microdebrider Intracapsular Adenotonsillectomy as Validated by Polysomnography

Brian K. Reilly, MD, Chicago, IL
Mark E. Gerber, MD, Evanston, IL
Joshua D. Levin, MD, Chicago, IL
Stephen H. Sheldon, DO, Chicago, IL
Krisztina J. Harsanyi, MD, Evanston, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to feel that microdebrider intracapsular tonsillectomy is an effective means of treating obstructive sleep apnea in the pediatric population.

Objectives: To evaluate the efficacy of microdebrider intracapsular tonsillectomy (MT) as a treatment for pediatric sleep obstructive sleep apnea (OSA). **Study Design:** A retrospective study evaluating outcome of microdebrider intracapsular tonsillectomy based on polysomnographic testing prior to and after surgical intervention. Polysomnogram outcomes were measured for patients who had undergone MT by a sole surgeon (MG) for OSA. **Methods:** Chart review of patients who were treated for obstructive sleep apnea/sleep disordered breathing syndrome using microdebrider intracapsular adenotonsillectomy and underwent polysomnograms both pre- and post-adenotonsillectomy (AT) at one of two tertiary care medical centers. **Results:** The total number of intracapsular adenotonsillectomies performed between 2001 and 2006 by senior author is 793. Of those tonsillectomies, roughly 6% of the patients underwent pre- and postoperative polysomnograms. Of this cohort, only 26 patients were nonsyndromic and without any chronic illnesses, and thus included in the study. Preoperatively, the mean respiratory distress index (RDI) was 16.75 (range of 2.03-124.71). Postoperatively, the mean RDI was 1.33 (range 0-3.8). Every patient had improved postoperative RDIs. Exactly half of patients had mild residual OSA and the other half had resolved OSA. There were no postoperative complications such as delayed hemorrhage in our study group and none had to undergo revision surgery for regrowth. **Conclusions:** MT appears to be an effective means of treating obstructive sleep apnea in the pediatric population.

8:32 The Effectiveness of Cricopharyngeal Botulinum Toxin A Injection for the Treatment of Globus Pharyngeus

Catherine J. Rees, MD, Winston Salem, NC
Christopher C. French, BS, Winston Salem, NC
Susan G. Butler, PhD, Winston Salem, NC
S. Carter Wright, MD, Winston Salem, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of botulinum toxin injection in the treatment of globus pharyngeus associated with cricopharyngeal hypertonicity.

Objectives: Globus pharyngeus is a nonpainful sensation of a lump or foreign body in the throat. Globus is a common complaint, accounting for 4-12% of initial visits to otolaryngology clinics and/or speech language pathologists. Globus has been associated with cricopharyngeal (CP) hypertonicity. Because of this finding, globus is sometimes treated with cricopharyngeal botulinum toxin injection and/or dilation, but the safety and effectiveness of this treatment has not been determined. The intent of this study was to analyze the success and complication rates of botulinum toxin injection into the CP when performed for the indication of globus pharyngeus with associated CP hypertonicity. **Study Design:** Retrospective case series. **Methods:** A chart review was performed for patients treated with botulinum toxin injection for the indication of globus pharyngeus. **Results:** Twelve of 17 (71%) subjects had followup data available. An average of 25 units botulinum toxin was used (range 7-50). Nine subjects (75%) had at least partial resolution of their globus symptoms, and 5 subjects had complete resolution. One subject (8%) who did not have preoperative dysphagia experienced temporary postoperative dysphagia. One subject with preoperative dysphagia had postoperative worsening of dysphagia symptoms. Two subjects (17%) had postoperative temporary regurgitation. There were no other complications in this series. **Conclusions:** Botulinum toxin injection with CP dilation appears to be an effective treatment for globus pharyngeus in the setting of CP hypertonicity. Patients should be counseled about the potential risks of postoperative regurgitation and dysphagia.

8:40 SECOND PRIZE - SOUTHERN SECTION FRANCIS LEJEUNE, SR. RESIDENT RESEARCH AWARD Avoiding Early Revision Rhytidectomy: A Biomechanical Comparison of Tissue

Plication Suture Techniques

Jeremy B. White, MD, Washington, DC

Mathieu Barraja, MS, Washington, DC

Tewodros Mengesha, MS, Washington, DC

Ryan Vallance, PhD, Washington, DC

William H. Lindsey, MD*, Reston, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to gain insights into the biomechanics of suture failure. The technique of a double-layered, running, locking stitch will be described and compared to interrupted horizontal mattress stitches used in rhytidectomy. The possibility of preventing the need for early revision rhytidectomy due to suture failure will be discussed.

Objectives: To compare the biomechanical properties of two different suture techniques that are used in SMAS plications during rhytidectomy: a double-layered, running, locking stitch (DRL) and multiple horizontal mattress stitches. **Study Design:** Prospective biomechanical data analysis. **Methods:** 14 horizontal mattress plications, in rows of six sutures, and comparable lengths of 16 DRL stitch plications of pig skin samples were stressed using a tensometer with grip displacement increasing at a constant rate of 0.5 cm/minute. The required force to cause plication failure was recorded for each sample at three suture break points. **Results:** There was no significant difference between the two groups in the force required to cause the initial suture failure. Unlike the horizontal mattress plication, this first break appeared to cause minimal to no distortion of the DRL tissue plication. When results were normalized by the initial break forces to account for small variations in tissue properties, the force ratio required to cause a second suture break was significantly larger in the DRL group than in the horizontal mattress technique. This is evidenced by the second to first break force ratios of 1.62 versus 1.13 for the DRL and horizontal mattress stitches, respectively, with a p-value of 0.06. The ratios of third to first break force for the DRL and horizontal mattress groups were 2.08 and 0.91, respectively, with a p-value of 0.08. **Conclusions:** The DRL stitch requires more force than the horizontal mattress stitch to cause significant failure of tissue plication. This technique may enable plastic surgeons to avoid early revision rhytidectomy due to suture failure and to create a longer lasting, youthful cosmetic result.

8:48 Correlation between Symptom Scores (SN-5) and CT Staging in Children with Chronic Rhinosinusitis

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

Andrew Terrell, MD, Morgantown, WV (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the symptom score questionnaire in children to that of CT scan score.

Objectives: Symptom score questionnaires for evaluation of CRS in adults did not correlate with CT scan score of paranasal sinuses. The SN-5 is a validated symptom score questionnaire for the evaluation of CRS in children. The purpose of this study was to evaluate the correlation of the SN-5 with the CT score in children. **Study Design:** Prospective followup of children that were evaluated in the office for symptoms of chronic rhinosinusitis. Children that had sinus surgery were excluded. **Methods:** Thirty-two children between the ages of 2-12 years were included. The mean age was 7.7 years (range 3.6—11.5; SD = 2.4). The caretakers completed the SN-5 during their visit when a CT scan of the paranasal sinuses was obtained. **Results:** The mean SN-5 score was 4.1 (SD= 1.03) and the mean Lund-Mackay CT score was 6.8 (SD= 4.3). There was a significant correlation between the SN-5 score and Lund-MacKay CT score ($r = 0.68$; $p < 0.0001$) for all children in the study. Twelve (38%) children had asthma and for those children the correlation was not significant ($r = 0.57$; $p = 0.057$). For non-asthmatics the correlation was stronger ($r = 0.73$; $p = 0.0003$). Age was also a confounder in that children under age of 7 years had a poorer correlation ($r = 0.55$; $P = 0.029$) compared to a stronger correlation in the children who were 7 years and older ($r = 0.73$; $p = 0.0012$). **Conclusions:** Symptom score questionnaire (SN-5) correlated to the disease severity as measured by the Lund-MacKay CT scan score. This seems to be different from what has been found in adults and may have positive implications for the followup of treatment of CRS in children since the frequent use of CT scans in children is discouraged for radiation purposes.

8:56 Q&A

9:05 - PANEL: BEYOND TONSILLECTOMY AND UPPP: 9:55 SLEEP SURGERY OPTIONS FOR CHILDREN AND ADULTS

Moderator: M. Boyd Gillespie, MD MS, Charleston, SC

Panelists: Stacey L. Ishman, MD, Baltimore, MD

David E. Tunkel, MD, Baltimore, MD

Regina P. Walker, MD, Hinsdale, IL

Kathleen L. Yaremchuk, MD*, Detroit, MI

9:55 Break with Exhibitors/Poster Viewing - Calusa D-H

Moderator

Francisco J. Civantos, MD*, Miami, FL

10:20 THIRD PRIZE (TIE) - SOUTHERN SECTION LLOYD STORRS RESIDENT RESEARCH AWARD

A Novel Endoscopic Reconstruction for Anterior Skull Base Defects: The Endoscopic Pericranial Flap Usage in the First Three Patients

Mihir R. Patel, MD, Chapel Hill, NC

Rupali N. Shah, MD, Chapel Hill, NC

Carl H. Snyderman, MD, Pittsburgh, PA

Ricardo L. Carrau, MD, Pittsburgh, PA*

Amin B. Kassam, MD, Pittsburgh, PA

Adam M. Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the benefits of vascularized endonasal skull base reconstruction and select which patients are candidates for anterior skull base reconstruction using a vascular pedicled pericranial flap via an endoscopic approach.

Objectives: To demonstrate the techniques, limitations and effectiveness of an endoscopically harvested vascular pedicled pericranial flap during reconstruction of anterior skull base defects. **Study Design:** Operative technique description and initial case series. **Methods:** Clinical outcomes of the first three endoscopic pericranial flap skull base reconstructions are described. Radioanatomic dimensions, particularly the area required to reconstruct an anterior skull base defect, a transellar approach defect, and a transclival approach defect, are reviewed and correlated to pericranial flap length planning. **Results:** The endoscopic pericranial flap has been used three times to reconstruct the endonasal anterior cranial fossa when other endonasal flaps were unavailable. All three patients had excellent healing and no postoperative cerebrospinal fluid (CSF) leak. One patient underwent postoperative radiotherapy without subsequent flap complications. There were no cases of facial nerve (CN 7) or trigeminal nerve (CN 5) dysfunction. **Conclusions:** Minimally invasive endonasal surgical techniques for skull base tumor removal are novel. While reconstruction has often lagged behind the ablative techniques for skull base surgery, the emerging use of the vascular pedicled nasoseptal flap has reduced CSF leak rates to less than 5%. However, anterior skull base defects from tumors such as esthesioneuroblastomas test the limits of endonasal reconstruction since nasoseptal tissue is often involved with tumor. A novel, endoscopic approach to harvesting the well known and versatile pericranial flap has been tested in 3 cases with good result and may provide a benefit for reconstruction of larger anterior skull base defects.

10:28 Toll-Like Receptor Agonists as Adjuvants for Dendritic Cell Tumor Fusion Vaccines

Edward I. Cho, MD, Cleveland, OH

Chunrui Tan, BS, Cleveland, OH

Gary K. Koski, PhD, Cleveland, OH

Peter A. Cohen, MD, Cleveland, OH

Suyu Shu, PhD, Cleveland, OH

Walter T. Lee, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the role of toll-like receptor agonists in the immune response of dendritic tumor fusion vaccines in their treatment of melanoma pulmonary metastases.

Objectives: To evaluate the therapeutic efficacy of dendritic tumor fusion cells and toll-like receptor (TLR) agonists in the treatment of melanoma pulmonary metastases. **Study Design:** Prospective murine in vivo and in vitro study. **Methods:** Dendritic tumor fusion cells were generated using electrofusion with murine D5LacZ melanoma cells. These were injected into the inguinal lymph nodes of C57BL/6N mice with three day established pulmonary metastases. The paired TLR agonists polyinosine:polycytidilic acid (poly I:C, 100µg/0.5mL) and CpG DNA (50µg/0.5mL) were then injected intraperitoneally to provide a third signal. The pulmonary metastases were enumerated 21 days after they were established. Enzyme linked immunosorbent (ELISA) assay was used to evaluate IL-12 production from the dendritic tumor fusion cells. **Results:** Dendritic tumor fusion cell yield was 19%. The average number of lung metastases in the non-treated control group (299 metastases) was not significantly greater than the fusion cell alone group (151 metastases), but it was significantly greater than both fusion + IL-12 group (0 metastases, p=0.008) and fusion + TLR group (52 metastases, p=0.008). However, the average number of lung metastases in the fusion cell alone group was not significantly greater than the fusion + TLR group. ELISA assay showed that the dendritic

tumor fusion cells yielded only 90 picograms of IL-12 after TLR stimulation compared to 1610 picograms produced by dendritic cells alone. **Conclusions:** CpG and poly I:C administered as a third signal with fusion cells as described do not significantly reduce melanoma metastasis compared to fusion cells alone. One mechanism for this may be the lack of IL-12 production after TLR stimulation of the dendritic tumor fusion cells.

10:36 **Transoral Laser Microsurgery (TLM) +/- Adjuvant Therapy for Advanced Oropharyngeal Cancer**

Jason T. Rich, MD, St. Louis, MO
Wade L. Thorstad, MD, St. Louis, MO
Douglas R. Adkins, MD, St. Louis, MO
James S. Lewis Jr., MD, St. Louis, MO
Bruce H. Haughey, MBChB, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of transoral laser microsurgery (TLM) in treating advanced oropharyngeal cancer. This study also provides an analysis of oncologic and functional outcomes following TLM and the impact of HPV status on survival.

Objectives: Long term oncologic and functional outcomes of TLM treated patients with advanced oropharynx cancer. **Study Design:** Prospective Phase 2 cohort study at a tertiary referral institution. **Methods:** The patient cohort was 1) previously untreated; 2) registered in a TLM database; 3) managed with TLM +/- adjuvant therapy for stage III or IV oropharynx cancer; and 4) followed for a minimum of 2 years. **Results:** Of 158 oropharynx cases in the database, 84 patients met inclusion criteria and their median followup was 49 months. 80 patients underwent neck dissection, 72 had adjuvant radiation treatment of which 23 also received chemotherapy. Overall stages were: III 15% and IV 85%. T-stages were: T1 and T2 74%, T3 and T4 26%. Both disease free survival and overall survival were 90% at 2 years and 83% at 5 years. Six patients (7%) recurred: local (1), regional (3), and distant (5). 63% of patients were HPV positive, with improved disease free survival at 5 years versus HPV negative patients (91% vs. 75%). T-stage and positive margins also significantly impacted survival, adjuvant chemotherapy did not. Five patients (6%) had major surgical complications, but without mortality. Regarding G-tube data (n=74), 4 of 5 patients who are G-tube dependent had feeding tubes placed during/after chemoradiation. The mean Functional Outcome Swallowing Scale score was 1.4 (oral intake, with episodic dysphagia). **Conclusions:** A large, mature study validates TLM +/- adjuvant treatment as an effective strategy for locoregional control (96.3%), survival, and functional organ preservation in advanced oropharynx cancer. HPV positivity improved survival.

10:44 **Myxoid Malignant Fibrous Histiocytoma of the Nasal dorsum Presenting as a Midline Nasal Mass in a Five Year Old Child**

Jeffrey R. Smit, MD, Danville, PA
Jaimie Derosa, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the histopathology of myxoid malignant fibrous histiocytomas, a rare pediatric non-rhabdomyosarcoma soft-tissue sarcoma (NRSTS); 2) illustrate the unique clinical presentation of this tumor as a pediatric midline nasal mass; 3) delineate common pitfalls and aberrant differential diagnoses associated with this tumor; 4) review the treatment options and role of surgical excision in myxoid malignant fibrous histiocytomas; and 5) understand the need for tumor specific protocols for successful treatment of pediatric non-rhabdomyosarcoma soft tissue sarcomas (NRSTSs).

Objectives: Myxofibrosarcoma and myxoid malignant fibrous histiocytoma are synonymous and describe a rare type of pediatric non-rhabdomyosarcoma soft tissue sarcoma (NRSTS). The case of a 5 year old female is presented, highlighting the potential for multiple pitfalls and aberrant differential diagnoses, which need to be identified for successful treatment of pediatric myxofibrosarcomas. An awareness of these tumors and a call for postsurgical standardized treatment protocols must be made in order to successfully treat these children. **Study Design:** Retrospective case review. **Methods:** Review of tertiary referral institution NRSTSs protocols. Literature review; OVID, PubMed, MD consult. **Results:** Malignant fibrous histiocytomas as a group may represent a morphologic modulation in the tumor progression of other sarcomas, including leiomyosarcomas and liposarcomas. Misdiagnosis occurs because of inadequate tissue sampling and confusion with other common contrast enhancing lesions of the nasal dorsum. The mainstay of therapy remains surgical resection, with tumor size and invasiveness dictating long term locoregional control. Adjuvant chemoradiotherapy maybe considered but is usually unsuccessful in the presence of either gross residual or metastatic disease. **Conclusions:** NRSTSs of childhood are exceedingly rare tumors of the pediatric head and neck. This is the first reported case in contemporary literature of a myxofibrosarcoma presenting as a midline nasal mass. Common diagnostic tools, including contrast enhancing imaging and FNA, can lead to misdiagnosis if such a lesion is not considered in the differential. Paramount in treatment is accurate intraoperative frozen section cytopathology and definitive permanent section diagnosis. Continued progress is warranted in developing novel therapies and effective protocols to treat this rare pediatric sarcoma.

10:52 The Level of Complete Dissection of the Ethmoid Sinuses Using a CT Image Guidance System

*Brad A. Rawlings, MD, Norfolk, VA
Joseph K. Han, MD, Norfolk, VA*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand how thoroughly the ethmoid sinuses are endoscopically dissected using a CT image guidance system by physicians in training.

Objectives: Determine the adequacy of endoscopic total ethmoidectomy by otolaryngology residents with the use of a CT image guidance system. **Study Design:** Retrospective observational study. **Methods:** Endoscopic sinus dissections were performed on cadavers by otolaryngology physicians in training (PIT). On each side of the cadaver, the ethmoid sinuses were examined independently. A cadaver was scanned prior to the dissection. The PITs performed a complete endoscopic total ethmoidectomy using a CT image guidance system. After the endoscopic ethmoidectomy, the cadaver underwent a post-dissection CT scan. The CT scans were then evaluated for the level of complete dissection of the anterior and posterior ethmoid sinuses. **Results:** There were 10 cadavers or 18 ethmoid sinuses in the study. There were 18 PITs involved in the project. 72% of the posterior ethmoid underwent incomplete resection with an average of 1.22 residual or unopened ethmoid cells. 77% of the anterior ethmoid underwent a complete resection with an average of 1.39 residual ethmoid air cells. Along the lamina papyracea, 89% of the ethmoid sinuses were incompletely resected with an average of 2.17 residual cells on the lamina. For both the anterior and posterior skull base, 44% of the anterior and posterior skull base was incompletely resected. There was an average of 0.56 residual cells along both the anterior and posterior skull base. **Conclusions:** Even with the use of a CT image guidance system, a complete ethmoidectomy was not performed in all the ethmoid sinuses. Residual ethmoid sinus cells are usually found along the skull base or lamina papyracea.

**11:00 THIRD PRIZE (TIE) - LLOYD STORRS RESIDENT RESEARCH AWARD
Cochlear Nerve Dimensions in Normal Hearing Ears Using High Resolution Magnetic Resonance Imaging**

*Eric M. Jaryszak, MD PhD, Gainesville, FL
Nimish A. Patel, MD, Gainesville, FL
Morgan D. Camp, MD, Chicago, IL
Anthony A. Mancuso, MD, Gainesville, FL
Patrick J. Antonelli, MD*, Gainesville, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the imaging characteristics of the internal auditory canal and explain normal values for the dimensions of the cochlear nerve in patients with normal hearing.

Objectives: Deficient cochlear nerves have been associated with poor cochlear implant performance. To this point, however, normative radiographic cochlear nerve data has not been published. The objective of this study was to determine if the diameter of the cochlear nerve (CN) could be reproducibly measured on parasagittal constructive interference in steady state (CISS) sequence MRI and establish normative data for these measurements. **Study Design:** Retrospective review of MRI images by two independent, blinded observers. **Methods:** Thirty patients (45 ears) with auditory complaints with a CISS sequence MRI in whom at least one ear had normal audiometric data were included. CN diameters were measured just medial to the fundus of the internal auditory canal (IAC) in a parasagittal plane by two independent observers. Cross-sectional areas were calculated and interobserver agreement was evaluated. **Results:** The CN was identified in 100% of studied ears. In 93%, the diameters were able to be measured by both observers. In 7% of ears, the cochlear nerve was unable to be measured secondary to the proximity of the nerve to the bone of the IAC. The CN vertical diameter (1.4 ± 0.21 mm), horizontal diameter (1.0 ± 0.15 mm), and cross-sectional area (1.1 ± 0.26 mm²) were normally distributed. There was good interobserver correlation for each measure. **Conclusions:** This experiment establishes normative radiographic data for cochlear nerve measurements. These data may now be used to evaluate prognosis in patients undergoing cochlear implantation, in patients with sudden hearing loss, and may be applied to other internal auditory canal structures.

11:08 Q&A

11:15 Introduction of Vice Presidents-Elect

Southern Section - John W. Youngblood, MD, San Antonio, TX
Middle Section - Charles Beatty, MD*, Rochester, MN*

11:20 Adjourn

SCIENTIFIC POSTER PROGRAM

Head & Neck

SM1. Indications and Outcomes of Double Free Flaps in Head and Neck Reconstruction

Patricio Andrades, MD, Birmingham, AL
Isaac A. Bohannon, MD, Birmingham, AL (Presenter)
Christopher F. Baranano, MD, Birmingham, AL
Mark K. Wax, MD, Portland, OR
Eben L. Rosenthal, MD, Birmingham, AL*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the indications for simultaneous double free flaps, know the realistic functional and aesthetic outcomes, as well as potential complications and morbidity.

Objectives: This study describes the clinical setting and operative outcomes for simultaneous double free flap treatment of extensive composite head and neck cancers. **Study Design:** Retrospective review. **Methods:** A retrospective review at two tertiary referral centers was performed. Patient demographics, cancer characteristics, reconstruction methods and postoperative evolution were recorded. All patients were assessed for diet, speech, aesthetics, socialization, and satisfaction using specific evaluation scales. **Results:** A total of 30 patients underwent double free flap reconstruction between 2001 and 2007. There were 19 males and 11 females, mean age of 62 years (range 42-79). Comorbidities were present in 67% of the cases and 70% smoked. Most frequently the cancer was a squamous cell carcinoma (90%), in advanced stage (87%), recurrent (67%), affecting the oral cavity (43%), larynx (23%) or pharynx (20%). The fibula osteoseptocutaneous-radial forearm fasciocutaneous flap combination was most commonly used (n=13), followed by the jejunum-radial forearm flap (n=10). Three flaps required early anastomosis revision; only two partial flap losses were observed. In 11 cases there was a severe recipient site complication: wound dehiscence (n=3), oral incompetence (n=4), fistula (n=2), and stenosis (n=2). The mean followup was 15.3 months. Patient satisfaction was poor to moderate. The overall functional evaluation score was low. **Conclusions:** Double free flaps for one-stage reconstruction of extensive head and neck defects should be used in selected cases. Although a reliable procedure, the long-term functional, aesthetic results are modest and realistic outcomes should be discussed with patients during planning and consent.

SM2. Scalp Melanoma: The Sunbelt Melanoma Trial

Adam C. Augenstein, MD, Louisville, KY
Jeffrey M. Bumpous, MD, Louisville, KY*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the prognostic significance of sentinel lymph node positivity in scalp melanoma versus other sites in the head and neck.

Objectives: To evaluate the clinicopathologic factors and prognosis associated with scalp melanomas in comparison to non-scalp melanomas of the head and neck (H&N). **Study Design:** Prospective, randomized. **Methods:** Patients aged eighteen to seventy years old with melanoma of the H&N >1.0 mm thick were enrolled. **Results:** Eighty-eight patients were enrolled with scalp melanoma. Men (79.5%) and Caucasians (100%) predominated with an average age of 49.8 years. The most common histologic subtypes were superficial spreading (39.7%), nodular (27.3%) and lentigo maligna (10.2%). The average thickness was 2.4 mm (+1.66) and 25% were ulcerated. Sentinel lymph node (SLN) positivity was seen in 20.9% of scalp melanoma patients, was more likely in younger patients (44.7 vs. 50.8 years, $p = 0.04$) and in those with a Breslow thickness of 2-4 mm ($p = 0.005$). The incidence of locoregional and distant recurrence between the scalp and non-scalp groups were similar. Overall survival for scalp melanoma patients was significantly impacted by SLN positivity ($p = 0.03$), while Breslow thickness and ulceration status predicted survival in non-scalp melanoma patients ($p = 0.005$, $p < 0.0001$, respectively). Similar significant findings in non-scalp melanoma patients were seen in regard to their disease free survival, while SLN positivity lost its significance in scalp melanoma patients. **Conclusions:** SLN status was the strongest predictor of overall survival in scalp melanoma in this study. Tumor thickness and ulceration correlated with overall survival in non-scalp melanoma of the H&N. The prognostic significance of SLN status in the head and neck may vary with the melanoma site.

SM3. Prognostic Indicators and Survival in Oral Cavity and Oropharyngeal Cancer

Jason P. Champagne, MD, Augusta, GA
Paul M. Weinberger, MD, Augusta, GA
Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss survival outcome predictors in relation to oral cavity and oropharyngeal cancer.

Objectives: To evaluate survival outcome predictors in oral cavity and oropharyngeal cancer in a university hospital setting. **Study Design:** Retrospective chart review. **Methods:** Medical records of 71 patients who were diagnosed with oral cavity or oropharyngeal SCCA and underwent surgical resection, chemo/XRT, or both from 2003 to 2008 were available for review. Data was collected including stage at presentation, presence of lymphovascular invasion, perineural invasion, and extracapsular spread. Additionally, time to recurrence and overall survival were investigated. This data was compared by means of both univariate and multivariate analysis through the use of Kaplan Meier estimates of survival function using log rank to test for statistical significance. **Results:** Patient population consisted of 55 men (77.5%) and 16 women (22.5%) with a mean age of 58.7 years. With regards to perineural invasion and extracapsular spread, overall survival and time to recurrence was not significant. Stage at presentation was also not a significant factor with regards to overall survival and time to recurrence. However, overall survival and median time to recurrence were significantly decreased ($P < 0.05$) in individuals whose pathology contained lymphovascular invasion regardless of staging. **Conclusions:** Tumors with known lymphovascular invasion may require more aggressive treatment, and awareness of this provides an additional counseling tool when discussing prognosis with patients. Further studies with a larger cohort of patients would improve the reliability of these findings.

SM4. Analysis of Outcome and Complications of a New Microvascular Head and Neck Reconstruction Program: Review of 142 Cases

Michael W. Chu, MD, Norfolk, VA
Jeffery Trad Wadsworth, MD, Norfolk, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the incidence and causes of complications involving microvascular free tissue transfer in the reconstruction of the head and neck; and 2) understand the challenges of developing a new microvascular head and neck reconstruction program.

Objectives: Review the outcomes of a single head and neck surgeon establishing a microvascular free tissue transfer reconstruction program in an academic tertiary hospital. **Study Design:** Retrospective case series. **Methods:** A total of 142 consecutive microvascular free tissue transfers were performed for head and neck reconstruction at an academic tertiary center. Patient demographics, tumor staging and histology, defect site, primary versus secondary reconstruction, and incidence of perioperative complications were documented prospectively during the first six years of a new reconstruction program. All perioperative complications, partial flap ischemia, and complete flap necrosis were recorded. **Results:** 140 patients underwent 142 free flaps; 90% of the defects were a result of neoplastic resection. Flap donor sites included radial forearm ($n = 59$), radial forearm with bone ($n = 2$), fibula ($n = 39$), rectus abdominis ($n = 30$), and jejunal flap ($n = 12$). Perioperative mortality was 2.1%. In the first year there were three cases of flap ischemia out of a total of 14 free flaps. Two were successful salvaged and one flap underwent complete flap necrosis for an overall flap success rate of 92.9% (13 of 14). During the next five years, there were four cases of partial ischemia with two eventual flap failures (126 of 128), for a 98.4% overall success. Overall free flap survival was 97.2% (138 of 142) and partial free flap ischemia was 4.9% (7 of 142), which is consistent with the 95% success rate in the reported literature. **Conclusions:** This study supports the reliability and effectiveness of free tissue transfer. Microvascular surgery is increasing more common and reflected in the increased emphasis in otolaryngology training. The future of head and neck treatment will have an increasing demand on free tissue transfer, and the establishment of more reconstructive programs can be expected. Some lessons learned in establishing a new reconstructive program include: increasing ancillary staff understanding of postoperative care of free tissue transfer patients, a multidisciplinary team approach to patient care, and establishing universal postoperative care protocols. New technologies, understanding of microvascular pathophysiology, and increasing microvascular training will have a positive impact on patient care and outcomes.

SM5. Malignant Fibrous Histiocytoma of the Head and Neck Region

David W. Clark, MD, Houston, TX
Brian A. Moore, MD, Eglin, FL
Dianna B. Roberts, PhD, Houston, TX
Erich M. Sturgis, MD MPH, Houston, TX*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the common pre-

senting sites of malignant fibrous histiocytoma in the head and neck region, discuss overall and disease specific survival, as well as the risks of local and distant failure, and finally, comment on different management strategies.

Objectives: Malignant fibrous histiocytoma (MFH) represents an aggressive soft tissue sarcoma found in the head and neck region. The purpose of this study is to review the experience of a large multidisciplinary cancer center experience with this entity. **Study Design:** Retrospective review. **Methods:** A retrospective review of MFH patients treated at a comprehensive cancer center. **Results:** Over a 40 year period, 95 patients presented with MFH of the head and neck region at our institution. The parotid/neck was the most common site, and 20 percent were radiation associated. Surgical resection alone was performed in 28 percent of patients, 26 percent received surgery with radiation, and 17 percent were treated with surgery plus chemoradiation. An additional 13 percent were treated with surgery plus chemotherapy and 16 percent were managed nonsurgically. With a median followup of 34 months, recurrence occurred in 36 percent after initial therapy, with local recurrence occurring in 73 percent, distant failure occurring in 37 percent. Overall 5 year survival for patients with MFH was 51 percent, with 5 year disease specific survival of 44 percent. Overall survival for radiation associated tumors was 58 percent, with 5 year disease specific survival of 42 percent. Better survival appeared to be associated with recent decade of treatment, parotid/neck tumor site, and surgery and radiation alone versus treatment with combined surgery with chemoradiation. **Conclusions:** MFH of the head and neck is an aggressive neoplasm characterized by local and/or distant failure and poor survival. The impact of prior irradiation remains undetermined. Optimal treatment regimens have yet to be elucidated.

SM6. Use of Optical Imaging to Predict Tumor Response to Anti-EGFR Therapy

*Nichole R. Dean, DO, Birmingham, AL
John Robert Newman, MD, Birmingham, AL
Emily E. Helman, MS, Birmingham, AL
Wenyue Zhang, MS, Birmingham, AL
William P. Lancaster, BS, Birmingham, AL
Eben L. Rosenthal, MD*, Birmingham, AL*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss new techniques that could predict patient response to treatment with cetuximab.

Objectives: Current treatment with anti-epidermal growth factor receptor (EGFR) antibody is costly, and there are few predictors to determine which patients will respond to therapy. The purpose of this study is to assess whether optical fluorescent imaging can be used to predict tumor response to anti-EGFR treatment. **Study Design:** Murine model using head and neck squamous cell carcinoma (HNSCC) xenografts and in vitro imaging of those cell lines. **Methods:** SCID mice were xenografted with SCC-1, FaDu, and CAL27 tumor cells and treated with anti-EGFR antibody, cetuximab, to evaluate tumor response. Imaging was performed after systemically injecting the fluorescently labeled bioconjugate cetuximab: Cy5.5 prior to treatment and at four weeks after initial treatment. Fluorescence intensity was determined for each image. To evaluate in vitro fluorescent internalization patterns, the same cell lines were labeled with cetuximab: Cy5.5 and imaged. **Results:** In vivo, SCC-1 tumor response was greatest, followed by FaDu and CAL27, with SCC-1 tumors being significantly smaller than control ($P=0.0001$). In addition, SCC-1 fluorescence was significantly greater than both FaDu and CAL27 ($P<0.001$). Tumor response corresponded with optical fluorescent intensity. In vitro, cells were evaluated for fluorescence internalization pattern. CAL27, which responded poorly in vitro, demonstrated the greatest nuclear internalization followed by FaDu ($P<0.05$) and SCC-1 cell lines ($P<0.0005$). Response to treatment appears to be inversely related to fluorescence internalization pattern. **Conclusions:** Optical imaging of EGFR expressing tumor tissue labeled with cetuximab: Cy5.5 may aid in determining which patients are most likely to benefit from cetuximab therapy.

SM7. Insular Thyroid Carcinoma in a Patient with Cowden Syndrome

*Henry R. Diggelmann, MD, Iowa City, IA
Douglas J. Van Daele, MD, Iowa City, IA
Thomas M. O'Dorisio, MD, Iowa City, IA
Henry T. Hoffman, MD MS*, Iowa City, IA*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss Cowden syndrome (CS) as characterized by benign and malignant hamartomatous growths, linked to a germline mutation in PTEN tumor suppressor gene; 2) discuss the common manifestation of CS, the most common of which being thyroid disease; 3) demonstrate proper clinical management and explain why early recognition of CS is imperative to decrease the morbidity of untreated hamartomatous growths.

Objectives: Cowden syndrome is an autosomal dominant disorder characterized by benign and malignant hamartomatous

lesions that can develop from all three germ cell derivatives. This disorder predisposes patients to develop malignant tumors of the breast, endometrium, and thyroid. CS is linked to a germline mutation in PTEN tumor suppressor gene located at 10q23.3 and is part of a collection of syndromes termed the PTEN Hamartoma-Tumor syndrome. **Study Design:** Case report. **Methods:** Literature review. **Results:** We present a patient with clinically relevant manifestations of Cowden syndrome, with genetic verification, impacting by way of airway compromise due to hamartomas, urinary tract abnormalities, and insular thyroid cancer, the last being a novel finding a patient with this syndrome. **Conclusions:** This case illustrates the value of recognizing Cowden syndrome at an earlier stage 1) when the patient could have received appropriate management to decrease the morbidity of untreated hamartomatous growths, and 2) an elective thyroidectomy would have been a viable option to manage his malignancy. Through this case report, we provide further insight into management of this disorder.

SM8. Actinomycosis of the Nasal Cavity: Case Report and Literature Review

Sreekrishna K. Donepudi, MD, Memphis, TN
Jonathan P. Hayes, MD, Jackson, MS
Sandeep Samant, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the head and neck manifestations of actinomycosis, especially in the nasal cavity and nasopharynx. Participants should also be able to list common risk factors for this rare infection and outline the recommended treatment.

Objectives: Actinomyces is a gram positive bacterial species that is often confused histologically with fungal infection due to its unique branching filamentous appearance. Actinomycosis is a rare disease in humans. Cervicofacial actinomycosis is the most common form of the disease accounting for 55% of cases. We present a rare case of cervicofacial actinomycosis affecting the nasal cavity. **Study Design:** Case report and review of literature. **Methods:** A case report is presented with review of literature of actinomycosis of the head and neck. Clinical presentation, radiographic imaging, and histopathology are presented. **Results:** A 44 year old male with hypertension and endstage renal disease presented with a one year history of nasal airway obstruction and eight day history of right-sided, intermittent epistaxis. He worked in an aluminum factory for many years in the past. Examination revealed a mass medial to the right inferior turbinate. Endoscopic removal of the mass revealed a gray, inorganic appearing material. Pathologic evaluation found sulfur granules and branching, filamentous bacteria consistent with actinomyces. Postoperatively, the patient reported resolution of his nasal symptoms and was treated with a six month course of oral penicillin for any residual infection. **Conclusions:** Cervicofacial actinomycosis is a rare and elusive disease. Nasal involvement is not always related to trauma and requires a high index of suspicion to diagnose. Chronic inhalation of toxic substances is a known risk factor for infection. Patients have a good prognosis when treated with prolonged antibiotic therapy and surgical debridement. The otolaryngologist should be aware of the variety of anatomic locations and clinical presentations associated with this infection.

SM9. Recurrent Anaplastic Ependymoma Metastatic to the Neck: Case Report and Literature Review

Sreekrishna K. Donepudi, MD, Memphis, TN
Paul A. Tennant, MD, Louisville, KY
Sandeep Samant, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to classify ependymomas, describe their natural course, and outline treatment options.

Objectives: Ependymomas represent 2-5% of all brain tumors and are classically treated with primary surgical resection and often require other treatment modalities such as local field radiation, gamma knife surgery, and chemotherapy for local control. Only the third case of anaplastic ependymoma metastasizing to the cervical lymph nodes is presented. **Study Design:** Case report and review of the literature. **Methods:** The clinical presentation, treatment course, intraoperative photographs, radiographic imaging, and histopathology are presented. **Results:** A 57 year old male with recurrent anaplastic ependymoma of his right parietal lobe was referred to otolaryngology with multiple nodules of his right face and neck. The patient had undergone multiple craniotomies, local field radiation, chemotherapy, and gamma knife surgery in the previous nine years for his recurrent tumor. He also had several resections for metastatic lesions to his right parietal scalp. To address the new lesions, he underwent right superficial parotidectomy and extended modified radical neck dissection within one week of presentation. Pathologic evaluation revealed anaplastic ependymoma with evidence of extranodal extension. Postoperatively, the patient received additional chemotherapy. He later underwent another craniotomy for recurrence at the primary site. The patient has an acceptable quality of life with complaints of only left-sided spastic hemiparesis and right-sided hearing loss. **Conclusions:** Anaplastic ependymomas are aggressive tumors which have a propensity for local recurrence as well as regional metastases. Gross total resection initially and also with each recurrence is recommended. Local field radiation, chemotherapy, and gamma knife surgery play a role as adjunctive treatments. Development of cervical metastases requires immediate referral to an otolaryngolo-

SM10. The Usefulness of PET Scans in Determining Metastases of Skin Cancer

Kimberly A. Donnellan, MD, Jackson, MS

J. Randall Jordan, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the indications for using PET scan for detecting metastatic lesions in skin cancer and recognize the pitfalls.

Objectives: To describe the clinical history of a patient with recurrent squamous cell carcinoma of the nasal skin whose pre-operative FDG-PET scan revealed what appeared to be bilateral parotid metastases, but on further evaluation was a false positive finding. Discussion will focus on the utility of PET in differentiating benign versus malignant lesions. **Study Design:** Case report. **Methods:** A 63 year old gentleman was referred to our clinic for a large squamous cell carcinoma of the nasal columella and right nasal vestibule. He underwent an extensive resection followed by reconstruction with bilateral nasolabial flaps, auricular cartilage grafts, and a full thickness skin graft. Two years later the patient presented with a subdermal recurrence. **Results:** A metastatic workup revealed marked FDG uptake on PET in the bilateral parotid glands. Because it was felt to be an unusual metastatic pattern, CT scan and FNA biopsy was obtained and revealed bilateral Warthin's tumors. Surgery included near total rhinectomy, bilateral auricular cartilage grafts, and a left paramedian forehead flap. **Conclusions:** Although PET serves as a valuable tool for evaluation of local and distant metastasis in the head and neck, it has limited utility for differentiating benign versus malignant lesions in the salivary glands. It is important that false positives be considered since multiple benign lesions such as Warthin's tumors, which have a high mitochondrial content, can result in a high uptake on PET. One must consider these benign lesions prior to planning treatment.

SM11. Adenocarcinoma (Not Otherwise Specified) of the Major Salivary Glands

Tarik Y. Farrag, MD MSc, Baltimore, MD

Shien M. Micchelli, MD, Baltimore, MD

Ralph P. Tufano, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to have more understanding of this disease, its presentation, and more insight about its management.

Objectives: To report our experience with managing primary adenocarcinoma, not otherwise specified (NOS), of the major salivary glands. **Study Design:** Retrospective chart review. **Methods:** We reviewed the charts of 20 consecutive patients with primary adenocarcinoma (NOS) of the major salivary glands (parotid, submandibular, and sublingual glands). **Results:** The reports of 20 consecutive patients who had a histopathologic diagnosis of primary adenocarcinoma (NOS) in the major salivary glands (parotid, submandibular, and sublingual glands) were evaluated. In 17/20 (85%) patients, the tumors developed in the parotid gland, while in 3/20 (15%), the tumors developed in the submandibular gland. 7/20 (35%) patients presented with stage IV; 9/20 (45%) patients presented with stage III; 2/20 (10%) patients presented with stage II; and 2/20 (10%) patients presented with stage I. Histopathologic examination of the specimens demonstrated the following: 15/20 (75%) patients had high grade (poorly differentiated) histologic type; 3/20 patients had intermediate to high grade type, and 2/20 patients had intermediate grade type. In 8/20 (40%) patients, there was a report of perineural invasion. Evaluation of the methods of initial treatment demonstrated the following: 19/20 (95%) patients had primary surgical excision of the tumors; 14/19 of them had concurrent neck dissections, while 4/19 had concurrent lateral temporal bone resection due to extension along the external auditory canal. All 19 patients had postoperative adjuvant radiotherapy; and 6/19 (32%) patients received chemotherapy in addition to radiotherapy after primary surgery. Evaluation of the post-treatment followup period demonstrated the following: 7/20 (35%) patients had evidence of recurrent/persistent disease after a median followup period of 2 years (3 months—7 years). All 7 patients recurred locally and 3 developed concurrent distant metastases. None of the patients who developed recurrent/persistent disease received postoperative chemotherapy in addition to radiotherapy ($p < .05$). **Conclusions:** Adenocarcinoma (NOS) of the major salivary glands is an uncommon disease that usually presents as a high grade lesion in an advanced stage. Surgical resection followed by radiotherapy has been the mainstay of treatment for advanced stage disease in the absence of distant metastases. The addition of chemotherapy to radiotherapy in the postoperative setting may improve disease control and warrants consideration.

SM12. Characteristics of Participants in a Free Oral, Head and Neck Cancer Screening Program

Christine G. Gourin, MD, Baltimore, MD*

Melonie A. Nance, MD, Baltimore, MD (Presenter)

Kavon C. Kaboli, Baltimore, MD

Erin J. Blume, RHIA, Baltimore, MD
Wayne M. Koch, MD*, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the behaviors and risk factors associated with head and neck cancer and understand the limitations of screening in capturing high risk individuals.

Objectives: Early detection of head and neck cancer is associated with improved survival. It is unclear if screening programs successfully target high risk populations. We sought to determine the characteristics of participants presenting for a free oral, head and neck cancer screening. **Study Design:** Prospective cohort study. **Methods:** Prospective analysis of 89 participants in a one day free oral, head and neck cancer screening as part of Oral, Head and Neck Cancer Awareness Week. **Results:** The majority of participants were female (57%) and not tobacco users (71%) with a mean age of 56 years (range, 23-83). One or more symptoms associated with head and neck cancer were reported by 59 participants (66%). There was no correlation between symptom prevalence and exam findings ($r=0.1161$). Ten participants (11%) had findings concerning for neoplasia and were referred for immediate consultation. Demographically, 64 (72%) of participants had attended college and 51 (57%) earned an annual income greater than \$30,000. The majority of participants (64%) believed that the screening increased their awareness and knowledge of oral and head and neck cancer. **Conclusions:** Free oral, head and neck cancer screenings achieve the goal of increasing awareness of oral and head and neck cancer and identifying a subset of individuals requiring further evaluation. However, individuals presenting for free oral, head and neck cancer screening do not share characteristics of the population at highest risk for the development of head and neck cancer based on risk factors and socioeconomic status. These findings suggest that early detection efforts need to be designed to target high risk populations.

SM13. Malignant Transformation of a Highly Aggressive HPV-11 Associated recurrent Respiratory Papillomatosis

Harrison W. Lin, MD, Boston, MA
Jeremy D. Richmon, MD, Boston, MA
Kevin S. Emerick, MD, Boston, MA
Ronald K. de Venencia, MD PhD, Boston, MA
Steven M. Zeitels, MD*, Boston, MA
Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presentation of an aggressive form of juvenile onset recurrent respiratory papillomatosis (RRP) and explain the incidence of and factors involved in the malignant transformation of RRP to squamous cell carcinoma.

Objectives: To present an uncommon case of squamous cell carcinoma (SCC) arising from severe recurrent respiratory papillomatosis (RRP) involving the upper and lower airway and temporal bone. **Study Design:** Case report and a review of the literature. **Methods:** We describe a case of a 24 year old woman with a history of human papilloma virus (HPV) type 11 since infancy originating in the larynx and trachea, then progressing to involve the distal pulmonary alveoli and right middle ear through the eustachian tube. Papillomatous growth was treated with multiple surgeries including laser cytorreduction of laryngo-tracheal papillomatosis and radical mastoidectomy, followed by a trial of chemotherapy. Despite this aggressive treatment regimen, papillomatous growth progressed with recurrence in the right eustachian tube, middle ear and mastoid extending to involve the calvarium and scalp. **Results:** The patient underwent a composite resection of involved tissues, including the scalp, auricle and lateral temporal bone, with reconstruction using a latissimus dorsi free flap. Final pathologic analysis revealed an extensive infiltrative well differentiated squamous cell carcinoma arising from the papilloma. A review of the literature on aggressive respiratory papillomatosis suggests that malignant transformation of juvenile onset RRP occurs exclusively in cases positive for HPV-11. **Conclusions:** We report an unusual case of SCC originating from an extensive RRP involving the airway, temporal bone and scalp and describe the medical and surgical management. Although the incidence of juvenile onset RRP transformation to SCC is very low, the presence of HPV-11 as a risk factor for malignant transformation of RRP is becoming evident.

SM14. Management of Neuroendocrine Carcinoma of the Head and Neck X

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Enver Ozer, MD, Columbus, OH
Ryan Meacham, BS, Columbus, OH
David E. Schuller, MD*, Columbus, OH
Amit Agrawal, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss typical presentation of neuroendocrine carcinoma in the head and neck primary sites such as parotid, larynx, and paranasal sinuses; 2) discuss

the prognosis of these tumors based on their grade and presenting characteristics; and 3) compare treatment options for these rare tumors.

Objectives: To review all cases of neuroendocrine carcinoma arising in the head and neck presenting to a comprehensive cancer center in the past 20 years, with attention to typical presentation, prognostic factors, and treatment. **Study Design:** A retrospective review of 31 adults with pathologically confirmed head and neck neuroendocrine carcinomas. **Methods:** The surgical pathology database was searched for neuroendocrine carcinoma arising in the head and neck between 1988 and 2008. Patients with histology consistent with metastasis were excluded, as were those under 18 years. Data was collected on tumor characteristics, presenting symptoms, patient comorbidities, treatment regimens, and outcome. The data was reviewed to determine typical presentations, prognostic factors, and factors guiding treatment decisions. **Results:** 89% presented with poorly differentiated tumors and 11% with moderately differentiated tumors. None was well differentiated. Estimated overall five year survival was 24% with a followup range of 1 to 122 months and a mean of 27 months. 27% of those with poorly differentiated tumors were alive at the end of the above followup period; 75% of those with moderately differentiated tumors were alive. 70% of survivors are disease free. The most common sub-site was the nasopharynx or paranasal sinuses. 42% were treated with surgery initially and 9% with chemoradiation. The remainder either went untreated or was treated with radiation or chemotherapy alone. **Conclusions:** Neuroendocrine carcinoma is often an aggressive disease with a range of treatment options; location of the primary, health and comorbidities of the patient, and stage of the disease play important roles in determining appropriate treatment.

SM15. Morbidity and Complication Rates of Neck Dissections: A Comprehensive Comparison of 200 Consecutive Cases

Eric J. Moore, MD, Rochester, MN

Sivakumar Chinnadurai, MD, Rochester, MN (Presenter)

Kerry D. Olsen, MD, Rochester, MN*

Jan L. Kasperbauer, MD, Rochester, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the complications and morbidity that go along with neck dissection and how these should factor into preoperative decision making.

Objectives: We will discuss the factors that have a significant impact on adverse outcomes following neck dissection. **Study Design:** Retrospective review. **Methods:** The charts of 200 consecutive patients undergoing neck dissections by three head and neck surgeons were reviewed. These were analyzed for adverse outcomes at 3 and 6 months after surgery. Patients were categorized according to a number of different factors including those in whom the current neck dissection was a primary or secondary form of treatment, whether neck dissection was unilateral or bilateral, and the extent of neck dissection (select, modified radical with CN XI sparing, modified radical with CN XI sacrifice, and radical). The rate of adverse outcomes was then analyzed for statistical significance using the 2 sided Fisher exact test. **Results:** Shoulder weakness was significantly higher in patients who were having neck dissection as a secondary treatment (following adjunctive therapy or previous neck dissection). Patients undergoing select neck dissection had a lower overall incidence of adverse outcomes and a decrease in shoulder weakness when compared to patients undergoing modified radical dissection. Patient with bilateral dissections did not show a significant increase in complications of any type when compared to unilateral dissection. **Conclusions:** Neck dissection is a frequent and integral part of the management of head and neck cancer patients. An understanding of the adverse outcome associated with these types of procedures is required to make appropriate preoperative decisions and to counsel patients who are to undergo neck dissection.

SM16. Outcomes Comparison of Free Tissue Transfers of the Head and Neck at Three Different Hospital Settings: Lessons Learned

Larry L. Myers, MD, Dallas, TX

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the outcomes of patient populations at different hospital settings undergoing free tissue transfers of the head and neck.

Objectives: Assess disparate outcomes of patients undergoing free tissue transfers of the head and neck across 3 different hospital populations; private, public (county) and veteran's administration (VA). **Study Design:** Retrospective chart review. **Methods:** Reviewed were the consecutive patients that underwent free tissue transfers of the head and neck by a single surgeon between July 2000 and July 2008 at the affiliated hospitals of an academic medical center in a large metropolitan area. Data were reviewed for preoperative variables (prior irradiation and chemotherapy, ASA score); free tissue transfer characteristics (flap area, harvest and ischemia times); intraoperative variables (estimated blood loss, fluid administration); postoperative variables (intensive care unit [ICU] and total hospital days); and post-treatment mortality. **Results:** There were 57, 50 and 60 patients at the private hospital, public hospital and VA hospital, respectively. Statistically significant factors were: intraoperative fluid administration [mean \pm SD: 4945 mL \pm 1969 mL v. 6273 mL \pm 3009 mL v. 6113 mL \pm 2207 mL ($p=0.008$)], ICU days [2.4 d \pm 1.4d v. 2.0 d \pm 1.1 d v. 7.7 d \pm 5.8 d ($p<0.0001$)], and total hospital days [9.5 d \pm 4.1d v. 11.5 d \pm 8.3 d v. 17.0 d \pm 13.9 d

($p=0.0002$]. Four (7%), seven (12%) and four patients (7%), respectively, experienced partial or total flap loss requiring an additional flap ($p=ns$). Prior irradiation and/or chemotherapy, ASA score, and free tissue transfer characteristics did not differ significantly. There were no significant differences in post-treatment Kaplan-Meier survival curves ($p=0.299$). **Conclusions:** Free tissue transfer can be performed at different hospital settings with comparably high rates of success. ICU and total hospital stays should be safely reduced in the public and VA hospitals, which may reduce hospital costs for these patient populations. This study also underscores the need to minimize intraoperative fluid administration.

SM17. Is True Follicular Thyroid Carcinoma Much Rarer Than Previously Reported?

Kristen J. Otto, MD, Toronto, ON Canada

Jeremy L. Freeman, MD FRCSC, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the incidence trends in thyroid carcinoma subtypes. The stricter pathologic criteria required to diagnose follicular thyroid carcinoma will be discussed, and the true rarity of follicular thyroid carcinoma will be demonstrated.

Objectives: Follicular carcinomas have been reported as 10-15% of thyroid malignancies. Recently, histologic criteria required for follicular carcinoma diagnosis have been made more rigorous, seemingly affecting current numbers. Also, reports documenting increases in thyroid cancer numbers have attributed the rise solely to papillary carcinomas. As such, it's likely that follicular carcinoma is much rarer than previously reported. We aim to document the true incidence of follicular cancers in a cohort from a high volume academic endocrine practice. **Study Design:** Retrospective chart review with historical control. **Methods:** Patients undergoing thyroidectomy between January 2006 and December 2007 were analyzed retrospectively. Patients included were those whose pathologic diagnosis was primary thyroid malignancy. Charts were reviewed for diagnoses made and histologic descriptions of the tumors. Cancers were classified into major subtypes; papillary cancers were further classified by common variants. Proportions of subtypes and variants were compared to historical SEER database proportions. **Results:** 258 patients with thyroid cancer were included. 7 (2.7%) patients had follicular carcinoma. Papillary carcinoma was identified in 243 (94.2%) patients; 125 (51.4%) had follicular variant. The proportion of patients with follicular cancer was less than previously reported rates of 10-15% and less than the 6.7% extrapolated from SEER. **Conclusions:** The proportion of follicular cancers is less than traditionally reported. This change is due to both an increase in papillary cancers, as well as stricter criteria required for follicular carcinoma diagnosis. There are potential prognostic and epidemiologic consequences, as follicular cancers have been perceived as more aggressive. Over time, this change may be associated with a shift in thyroid cancer outcomes.

SM18. Long Term Results of Speech Rehabilitation in Total Laryngectomy Patients: Primary Versus Secondary Tracheoesophageal Punctures

Helen E. Perakis, MD, Augusta, GA

Lana L. Jackson, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the advantages and complications of performing a primary versus a secondary TEP. Participants will be able to discuss the success rate of voice rehabilitation in patient who underwent a primary TEP. They will also be able to compare vocalization in these patients with regard to having received preoperative radiation therapy.

Objectives: This study was designed to evaluate the success of voice rehabilitation and complication rate in patients who underwent laryngectomy with primary tracheoesophageal puncture (pTEP). **Study Design:** Retrospective clinical review performed at a tertiary academic center. **Methods:** Fifty individuals who underwent total laryngectomy with pTEP from 6/2003 to 3/2007 were studied. Subjective information on voice rehabilitation and the occurrence of microstomia requiring stomaplasty, dislodgement rates, and leakage were recorded. Patients were then divided into a previously radiated group and a nonradiated group, and voice rehabilitation success, as well as complication rates, were compared between these two subgroups. Differences in proportions were analyzed using Chi-square. **Results:** Approximately 65% of patients who received a TEP at the time of their total laryngectomy had successful voice rehabilitation. Microstomia requiring stomaplasty occurred in 17.4%, dislodgement rate in 13.6%, and leakage in 13%. Of patients who had undergone preoperative XRT, 90% experienced microstomia, which was significant ($p 0.05$). 72% of patients who had undergone preoperative XRT were aphonic, compared to 8.3% of patients not previously radiated. Patients with preoperative XRT and failure of successful voice rehabilitation was significant ($p 0.007$). **Conclusions:** Primary TEP following laryngectomy is associated with successful voice rehabilitation in the majority of patients. Preoperative radiation therapy is highly associated with failure to achieve voice rehabilitation and an increased risk of microstomia. Secondary TEP should be considered in patients requiring irradiation prior to laryngectomy, and measures to prevent microstomia should be incorporated into the postoperative care of such patients.

SM19. National Laryngopharyngectomy and Reconstructive Surgery Survey

Jeremy D. Richmon, MD, Boston, MA
Hussein A. Samji, MD, Palo Alto, CA
Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, participants should understand the various methods available to reconstruct total laryngopharyngectomy defects and to what degree various factors influence the surgeon in choosing a particular reconstructive method.

Objectives: 1) To understand the various methods available to reconstruct total laryngopharyngectomy defects; and 2) to understand which, and to what degree, various factors influence the surgeon in choosing a particular reconstructive method.

Study Design: Survey study. **Methods:** Otolaryngologists and plastic surgeons who perform head and neck reconstruction were surveyed regarding preference of laryngopharyngectomy reconstruction. Numerical and rank order data was analyzed using T statistics and Fisher's Exact Test. **Results:** Two hundred surveys were mailed and seventy-two physicians (36% response rate) provided data with otolaryngologists comprising 54% of the respondents. Otolaryngologists were more likely to consider voice ($p = 0.003$) and swallowing ($p = 0.02$) outcomes compared to plastic surgeons. In contrast plastic surgeons more often included cosmesis ($p = 0.05$) among those factors influencing their reconstructive choice. However rank order analysis demonstrated no statistical difference between plastic surgeons and otolaryngologists with respect to each factor.

Conclusions: Our study sought to examine what motivates surgeons from several specialties to choose one reconstructive method over another for laryngopharyngeal defects. Otolaryngologists were more likely to consider voice and swallowing function in contrast to plastic surgeons who more frequently included cosmesis as a factor. However when physicians were asked to rank the importance of each of the eight factors from most to least important in influencing their reconstructive option, there was no statistical difference between plastic surgeons and otolaryngologists with respect to each factor. Further research is necessary to provide an evidence base for which reconstructive method offers the optimal functional restoration.

SM20. Reconstruction of Lateral Skull Base Defects after Combined Parotidectomy and Temporal Bone Resection for Malignancy

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Adrien Eshraghi, MD, Miami, FL
David J. Arnold, MD, Miami, FL
Francisco J. Civantos, MD*, Miami, FL
Donald T. Weed, MD*, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the complexity of lateral skull base defects following ablative surgery for malignancies; 2) review the reconstructive options available for different types of surgical defects; and 3) establish the fundamental basics on which a reconstructive algorithm can be developed.

Objectives: Lateral skull base defects present a particular challenge for the reconstructive surgeon after ablative surgery for malignancy. These defects are often complex and require that more than local tissue be used due to the sheer size of the defects as well as the need for post-op radiation or a history of radiation failure. Free tissue transfer when possible is the commonly accepted gold standard for large defects. However, for reasons related to the patient's underlying health status and/or for defects of intermediate size, locoregional flaps could also be used for reconstruction. This study reviews our experience with reconstruction after combined parotidectomy and lateral temporal bone resection for lateral skull base malignancies. **Study**

Design: Retrospective single institution case series at a tertiary care university hospital. **Methods:** All cases between 2000 and 2007 were included. Patient demographics, tumor characteristics, operative reports, and clinical followup were recorded.

Results: 79 patients (17 women and 62 men) with a mean age of 65 years were included. 54 patients had skin cancer (primary or metastatic) while 17 had primary parotid malignancies. 26 patients had radiation preoperatively. 8 patients underwent a neurosurgical approach as part of their surgery. Free flap reconstruction was done in 25 patients. 33 patients (42%) developed wound related postoperative complications of which 11 were major (mandating revision surgery). **Conclusions:** Surgical outcome and complications are reviewed with relation to significant potential prognostic variables. Based on this review, an algorithm for reconstruction of lateral skull base defects following combined parotidectomy and temporal bone resection is presented.

SM21. A Combined Transoral and Transnasal Endoscopic Approach to Resection of Maxillary Ameloblastoma with Extension to the Anterior Skull Base

Andrew R. Scott, MD, Boston, MA
Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the incidence, clinical features and pathologic characteristics of maxillary ameloblastoma and discuss prior reports of maxillary ameloblastoma

with skull base extension. Following this presentation, participants should also be able to explain the rationale for a minimally invasive approach to resection of these benign but locally invasive tumors.

Objectives: To review the epidemiology, presenting symptoms, and clinical characteristics of maxillary ameloblastoma and to describe a novel approach to resecting these locally aggressive tumors. **Study Design:** Retrospective chart review and review of the literature. **Methods:** Case report and review of the literature. **Results:** We describe a case of an 86 year old woman who presented with progressive left-sided nasal obstruction and rhinorrhea. Examination demonstrated a gelatinous mass completely filling the left nasal cavity, and imaging revealed tumor filling the left maxillary sinus and nasal cavity with extension to the anterior skull base. A transnasal biopsy was consistent with ameloblastoma. The maxillary component of the mass was successfully resected via a transoral left palatotomy. The remainder of the tumor, which filled the left nasal cavity, ethmoid air cells, and frontal sinus, was removed through a transnasal endoscopic approach. **Conclusions:** Ameloblastoma is a benign odontogenic tumor that is locally invasive but does not metastasize. The classic approach to removal of these tumors involves a lateral rhinotomy incision. Maxillectomy with 1 cm resection margins is the optimal surgical treatment for this disease, and this can be accomplished in select cases through a combined transoral and endoscopic approach, thereby avoiding an external incision and shortening recovery time.

SM22. Diagnosis and Management of Cervical Sympathetic Chain Paraganglioma

Rahul Seth, MD, Cleveland, OH
Karah M. Lanier, MD, Norfolk, VA
Aaron P. Hoschar, MD, Cleveland, OH
Joseph Scharpf, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to identify that cervical sympathetic chain paragangliomas are a unique entity with distinct clinical presentation, imaging characteristics, and management.

Objectives: Paragangliomas are rare, slow growing, neuroendocrine tumors that develop at autonomic ganglia. They originate from extra-adrenal paraganglia, which are derivatives of neural crest cells. In the head and neck region, these tumors most commonly occur at the carotid body, jugular bulb, and vagus nerve. Paragangliomas arising from the cervical sympathetic chain, however, are exceedingly rare, with only nine cases reported in the literature. The aim of this study is to describe the clinical presentation, diagnosis, management, and outcome of this uncommon entity. **Study Design:** This was a retrospective case study and review of the literature. **Methods:** We describe a 46 year old male patient, who presented with a three year history of a right-sided Horner's syndrome, an enlarging neck mass, and worsening dysphonia. MRI evaluation revealed a 6 x 3 x 3 cm mass without flow voids that laterally displaced both the carotid and jugular vessels and only mildly splayed the internal and external carotid arteries. **Results:** Intraoperatively, the tumor was observed to arise from the right cervical sympathetic chain and was hypervascular with several feeding branches from the external carotid artery. Histopathological analysis confirmed diagnosis of paraganglioma with typical findings. **Conclusions:** Paragangliomas arising from the cervical sympathetic chain are exceptionally rare but must remain in the differential diagnosis of parapharyngeal masses. Presentation of Horner's syndrome in addition to a lack of distinct imaging characteristics of sympathetic chain schwannoma may warrant suspicion for paraganglioma of the cervical sympathetic chain.

SM23. Lingual Thyroidectomy: Endoscopic and Harmonic Assisted

Melanie W. Seybt, MD, Augusta, GA
R. Bauer Vaughters, MD, Aiken, SC
David J. Terris, MD, Augusta, GA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss a new technique for removal of an obstructive lingual thyroid gland and compare it with conventional techniques.

Objectives: The thyroid gland occasionally fails to descend during development, and surgery becomes necessary when obstruction occurs. A new technique is described which facilitates removal of the gland with minimal invasiveness and optimal hemostasis. **Study Design:** Prospective analysis of a new surgical technique. **Methods:** The procedure is performed in approximately one hour, requires no lip or tongue split, is associated with minimal to no blood loss, and is accomplished on an outpatient basis. Liberal videodocumentation (preoperative, intraoperative and postoperative) is provided to demonstrate this new technique. **Results:** The procedure was undertaken in a 30 year old woman with a longstanding lingual thyroid that began to cause dysphagia. She was found to be clinically and biochemically euthyroid and was referred for surgical intervention. **Conclusions:** A number of surgical approaches to the lingual thyroid have been described, including the use of a lip split, tongue split, mandibulotomy, cervical approach and lip degloving. We describe a minimally invasive procedure that incorporates harmonic technology and high resolution endoscopy and is accomplished with no external incisions on an outpatient basis.

SM24. Minimally Invasive Thyroid Surgery in Children

Melanie W. Seybt, MD, Augusta, GA

Jerry T. Todd, BS, Augusta, GA

David J. Terris, MD, Augusta, GA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss benefits of minimally invasive thyroid surgery in pediatric patients and compare rates of malignancy to an adult population.

Objectives: To evaluate the benefits of minimally invasive thyroid surgery in a pediatric population, including improved cosmesis and preservation of tissue planes. To assess rates of malignancy and compare to our adult population. **Study Design:** Prospective analysis of a consecutive single surgeon series of pediatric patients undergoing thyroid surgery at an academic health center. **Methods:** IRB approval was obtained to analyze a prospective database and assess outcomes data. Outcome measures included pathology, cosmetic result, rates of complications, especially hypocalcemia, TVC paralysis, and need for admission or readmission. **Results:** Four hundred ninety-four patients underwent thyroidectomy during the study period (February 2003 to May 2008). Of these, 22 were under the age of 21. The mean incision length was 3.36 +/- 0.94 cm (range 20-50mm, and 7 [31.8%] were shorter than 30 mm in length). Nine patients (41%) had thyroid cancer, most commonly papillary carcinoma (compared with 21.9% of the adult population). There were no hematomas and no cases of permanent TVC paralysis or permanent hypocalcemia. Two patients (9%) experienced temporary hypocalcemia, both requiring readmission. **Conclusions:** Minimally invasive thyroid surgery has benefits over conventional thyroid surgery, particularly in a pediatric population. Among its many potential advantages, the social stigma of a large incision is reduced and preservation of tissue planes is improved.

SM25. Endoscopic Nasoseptal Flap Reconstruction for Pediatric Skull Base Defects

Rupali N. Shah, MD, Chapel Hill, NC

Mihir R. Patel, MD, Chapel Hill, NC

Benjamin Huang, MD, Chapel Hill, NC

Ricardo L. Carrau, MD, Pittsburgh, PA*

Carl H. Snyderman, MD, Pittsburgh, PA

Adam M. Zanation, MD, Chapel Hill, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to determine which pediatric patients are candidates for skull base reconstruction using the vascular pedicled nasoseptal flap based on age and potential flap dimensions. They should also become familiar with the technique of the pedicled nasoseptal flap for skull base reconstruction.

Objectives: Out of 150 prospective nasoseptal flap reconstructions, six were pediatric patients. Anecdotal evidence by the senior author revealed less available relative septal area in pediatric patients for skull base reconstruction. Radioanatomic analysis of CT scans will demonstrate that potential nasoseptal flap dimensions compared to skull base dimensions are significantly smaller for younger children than for older children and adults. We also describe the clinical outcomes of six pediatric nasoseptal skull base reconstructions. **Study Design:** Fifty de-identified maxillofacial CTs of individuals <18y were analyzed and compared to ten adult images. **Methods:** Measurements included potential nasoseptal flap dimensions, dimensions required to reconstruct an anterior skull base defect, a transellar approach defect, and a transclival approach defect. Width and length comparisons of the nasoseptal flap to a skull base defect were calculated for each defect and each CT scan. Age stratified calculations were analyzed. **Results:** Width and length ratios of potential nasoseptal flap dimensions to anterior skull base defects are 1.33 and 0.89, respectively for pediatric patients under the age of four; and 1.42 and 1.22, respectively for adults. Age stratification for ages 0-18 showed dimensions of the nasoseptal flap in children less than nine to ten are smaller than potential skull base defects in these patients. **Conclusions:** Cranial growth is not surpassed by septal growth until between the ages of eight and nine. Adequate nasoseptal skull base reconstruction for large defects after an endonasal approach may not be possible for children <9y. The nasoseptal flap is usually sufficient to cover transcribriform, transellar, or transclival defects in older children and adults.

SM26. Reliability of Pathologic Angioinvasion for Mobile Tongue Squamous Cell Carcinomas

Taha Z. Shipchandler, MD, Cleveland, OH

Joseph Scharpf, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the difficulty in reliably determining angioinvasion on histopathologic examination for mobile tongue squamous cell carcinoma.

Objectives: The purpose of this study is to determine if “angioinvasion” can be consistently identified in a reliable fashion on histopathologic examination. **Study Design:** Case series. Retrospective chart review and reexamination of histologic slides. IRB approved study. **Methods:** Retrospective chart review of 15 patients with primary T1-T2 mobile tongue squamous cell carcinomas demonstrating angioinvasion was performed. Histologic specimens were resectioned and reviewed to test consistency of angioinvasion on histopathologic examination. Data collected from charts included: age, sex, TNM stage, treatment strategies, overall survival, disease free survival, and locoregional control. **Results:** Of the six histopathologic specimens reexamined to date, one patient’s tumor was positive for angioinvasion on reexamination but was originally negative. One other patient’s specimen was deemed negative on reexamination that was originally positive. The majority of patients were treated with adjuvant therapy after primary resection due to the initial read of angioinvasion. Further results from all 15 patients will be discussed. **Conclusions:** Angioinvasion noted on histopathologic examination is difficult to assess even by experienced head and neck pathologists. Based on sectioning of specimens, interpretations may vary. This variability questions whether evidence of angioinvasion should affect treatment strategies.

SM27. Pigmented Villonodular Synovitis of the Temporomandibular Joint: A Case Report and Literature Review

Mahdi A. Shkoukani, MD, Detroit, MI

Senja Tomovic, , Detroit, MI

Kailash Narasimhan, MD, Detroit, MI

Lewis Clayman, MD DMD, Southfield, MI

Robert H. Mathog, MD, Detroit, MI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the presenting symptoms, pathophysiology, workup and treatment of pigmented villonodular synovitis (PVNS) of the temporomandibular joint (TMJ).

Objectives: Pigmented villonodular synovitis (PVNS) is a benign proliferation of tissues within a joint. It most frequently affects large joints such as the knees, hips and hands. Its occurrence in the temporomandibular joint (TMJ) is extremely rare. Radical excision with wide margins is the most accepted treatment modality. PVNS is resistant to radiotherapy. **Study Design:** A case report. **Methods:** A 74 year old female presented to our clinic complaining of a right preauricular mass that she noticed for a couple of years. The mass was growing slowly and never bothered her till recently. She started to have pain with jaw opening. Also, trismus became more pronounced. Cat scan (CT)-neck with intravenous contrast showed an enhancing mass surrounding the right mandibular condyle, with expansion of the temporomandibular joint. CT guided biopsy of the right TMJ confirmed the diagnosis of PVNS. **Results:** Patient underwent tracheostomy, right superficial parotidectomy followed by right condylectomy and partial mandibulectomy. Intraoperatively, the tumor was destroying the condyle and invading the meniscus, masseter and pterygoid muscles and extending medially toward the skull base. Histologically, PVNS-diffuse type was confirmed in the specimen with negative margins. Postoperatively, patient developed right facial paralysis which is a common complication in these patients. **Conclusions:** PVNS is a rare lesion in the TMJ. Preauricular mass is the most common presenting symptom. CT guided biopsy along with CT neck is crucial in the workup. Resection of the lesion with wide margin is the recommended treatment. Facial paralysis is a complication of the surgical treatment but it is usually shortly lived.

SM28. Cervical Thymic Cyst in Adults: Consideration within a Neck Mass Workup Algorithm

Joshua Benjamin Silverman, MD PhD, Boston, MA

William C. Faquin, MD PhD, Boston, MA

Jeremy D. Richmon, MD, Boston, MA

Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the relevant clinical features and pathological characteristics of cervical thymic cysts; 2) compare differences in presentation of cystic neck masses among disparate age populations; 3) discuss proposed pathogenetic mechanisms for development of thymic cysts as well as the proper surgical management; and 4) understand a comprehensive algorithm for the workup of cystic neck masses.

Objectives: Review the epidemiology, clinical features, pathogenesis, and histopathology of thymic cysts, as well as suggest appropriate management of cystic neck masses. **Study Design:** Case report and literature review. **Methods:** Retrospective chart review and literature review. **Results:** Cervical thymic cysts are rare lesions that most often occur in the pediatric age group; there are few published reports of thymic cysts in the adult population. In reviewing our records over a ten year period, we have found 3 incidences of thymic cysts. In one example, we present a 38 year old woman with complaint of a slowly enlarging neck mass over the prior two years. Imaging confirmed a 9x5 cm cystic mass extending inferiorly from the parapharyngeal space, displacing the carotid sheath. Fine needle aspiration consisted of cyst contents only, but a benign process was favored. Histopathologic evaluation following complete surgical excision demonstrated a cystic structure lined by low cuboidal epithelium, surrounded by a dense fibrous wall with well defined Hassall’s corpuscles characteristic of a thymic cyst. In addition to a

discussion of proposed pathogenetic mechanisms and characteristic pathologic features, we will compare our patients' presentations with usual clinical scenarios in the pediatric population. Finally, we will propose an algorithm for workup of cystic neck masses, in which thymic cysts can be considered. **Conclusions:** Despite its rare occurrence, thymic cyst can present in adult patients as a unilateral cystic cervical neck mass. Surgical management continues to be an essential component for both diagnosis and treatment of cystic neck masses.

SM29. Submandibular Gland Transfer for Xerostomia Prevention in Patients Undergoing Chemotherapy +/- Radiation Therapy

Jacob E. Smith, MD, Charleston, SC
Marion B. Gillespie, MD, Charleston, SC
Anand K. Sharma, MD, Charleston, SC
Terry A. Day, MD, Charleston, SC
Joshua D. Hornig, MD, Charleston, SC

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the emerging role of submandibular gland transfer as the most successful preventative treatment of xerostomia in patients undergoing surgery with post-op chemoradiation therapy or in patients undergoing primary chemoradiation therapy for cure. Participants will also be able to compare SMGT to other methods of xerostomia prevention and discuss the safety and feasibility of SMGT.

Objectives: Previous studies suggest that xerostomia may be prevented by submandibular gland transfer (SMGT) at the time of primary surgical resection prior to adjuvant XRT. The objective of this study is to review the complications and results of SMGT in a series of patients and provide the initial report on the safety of the procedure prior to chemoradiation therapy. **Study Design:** A retrospective case series of head and neck cancer patients receiving SMGT prior to radiation therapy +/- chemotherapy. **Methods:** Factors analyzed included demographics, tumor site, stage, treatment, xerostomia outcomes, complications, recurrence, and followup time. **Results:** 12 patients underwent SMGT over a 24 month period. Four women and eight men with a mean age of 60 years (range, 45-77) presented with stage III (3 patients) and stage IVa (9 patients) disease. Three patients underwent SMGT prior to primary chemoradiation, while 9 were at the time of surgical resection followed by radiation +/- chemotherapy. The only SMGT-related complication included seromas in 2 patients (17%) that were drained in clinic without long term sequelae. There were no recurrences at the site of SMGT. Ten of the 12 (83%) denied clinically significant xerostomia, whereas two patients complained of mild xerostomia after a mean followup time of 323 days (range, 17-716). **Conclusions:** Submandibular gland transfer is a feasible, safe, and seemingly successful option in preventing xerostomia in patients undergoing surgery or chemoradiation as primary treatment of H&N cancer. There did not appear to be any significant delays in beginning treatment on account of the transfer.

SM30. THIRD PRIZE - LAWRENCE R. BOIES RESIDENT RESEARCH AWARD **Does Vocal Cord Fixation Preclude Nonsurgical Management of Laryngeal Cancer?**

Clementino Arturo Solares, MD, Cleveland, OH
Benjamin G. Wood, MD, Cleveland, OH
Cristina P. Rodriguez, MD, Cleveland, OH
Robert R. Lorenz, MD, Cleveland, OH
Joseph Scharpf, MD, Cleveland, OH
David J. Adelstein, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should have knowledge to support the use of chemoradiation in T3/T4 laryngeal cancer patients with pretreatment vocal cord fixation.

Objectives: To determine whether vocal cord fixation precludes nonsurgical management of T3/T4 laryngeal carcinoma. **Study Design:** A retrospective chart review. **Methods:** The institutional head and neck cancer chemoradiotherapy registry was interrogated for patients treated with concomitant cisplatin based chemoradiation therapy, between 1990 and 2005, for T3/T4 SCC of the larynx with vocal cord fixation at presentation. Only those patients with adequate pre- and post-treatment fiberoptic laryngoscopies were included. Patients' charts were reviewed for demographics and tumor characteristics, return of vocal cord function, local, regional, or distant recurrence after treatment, and need for salvage surgery. The Kaplan-Meier method was used to estimate outcomes, and the log-rank test was used to compare those patients whose vocal cord remained fixed and those with recovery of vocal cord function. **Results:** Twenty-three patients met the inclusion criteria; 19 males and 4 females. The median age was 59 (range 39-73) years. Nine patients had T3 and 14 had T4 tumors. Twelve patients recovered full range vocal cord function, 3 patients had partial recovery, and 8 patients did not recover motion. The median followup is 68 (range 34-191) months. In comparing those patients with post-treatment partial or fully mobile cords, with those whose cords remained fixed, the projected five year overall survival is 100% vs. 25%, ($p < 0.001$), local control without surgery 87% vs. 30% ($p = 0.003$), and larynx preservation 87% vs. 40% ($p=0.014$) respectively. **Conclusions:** Nonsurgical therapy in patients with pre-

treatment vocal cord fixation is feasible and successful. However, persistence of vocal cord fixation after definitive chemoradiotherapy is a poor prognostic sign.

SM31. Giant Cell Tumor of the Masticator Space: Case Report and Literature Review

Melissa L. Somers, MD, Detroit, MI
Scott A. McLean, MD PhD, Detroit, MI
Frank Torres, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the diagnosis, management, and prognosis of giant cell tumors of the head and neck.

Objectives: Case report of a male with giant cell tumor epicentered in the masticator space and a review of diagnosis, management, and prognosis. **Study Design:** Case report and literature review. **Methods:** Review of the literature to assess cases of giant cell tumors, with particular attention to cases involving the temporomandibular joint. **Results:** Differential diagnosis includes extra-articular tenosynovial diffuse giant cell tumor and soft tissue giant cell tumor of low malignant potential. **Conclusions:** Few cases of giant cell tumors involving the temporomandibular joint have been reported. The management of these tumors involves surgical excision with close followup to monitor for recurrence.

SM32. Reoperative Thyroidectomy for Benign Thyroid Disease: The Diminishing Role of Subtotal Thyroidectomy

David J. Terris, MD, Augusta, GA*
Sunny A. Khichi, BA, Augusta, GA (Presenter)
Susan K. Anderson, DO, Conyers, GA
Maysoun A. El-Choufi, MD, Augusta, GA
Melanie W. Seybt, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the risks associated with reoperative thyroid surgery and understand the importance of a thorough primary operation.

Objectives: Benign thyroid conditions sometimes require surgical intervention. While historically a subtotal thyroidectomy was considered appropriate management, delayed recurrence of disease necessitating reoperative thyroidectomy may introduce significant potential risk, including hypoparathyroidism and recurrent laryngeal nerve (RLN) injury. We describe our experience with reoperative thyroidectomy for benign thyroid disease and recommendations for definitive primary surgical management of benign thyroid conditions. **Study Design:** Prospective, nonrandomized analysis of a consecutive single surgeon experience with reoperative thyroidectomy for benign disease in an academic health center. **Methods:** Patients undergoing thyroid surgery between February 2003 and May 2007 were prospectively assessed and demographic data was obtained. Clinical parameters considered included patient age and gender, indications for primary and reoperative surgery, histopathology from primary and reoperative surgery, interval between primary and reoperative surgery, operative time, duration of hospital stay, complications, and incision length. **Results:** Three hundred twenty-one thyroidectomies were performed during the study period. Forty-five (14%) cases were identified as reoperative thyroidectomy. Twenty-two (49%) of these reoperative cases related to a benign thyroid condition. The mean interval from the primary operation to the reoperative procedure was 11.9 years (range 1 year to 43 years). Two patients presented with preexisting vocal cord paralysis (VCP). There were no cases of permanent or transient nerve injury related to reoperative surgery. There was one case of transient hypocalcemia. **Conclusions:** While reoperative thyroidectomy can be performed safely in the hands of experienced surgeons, a thorough initial surgical procedure should obviate the need for exposure to this additional risk.

SM33. Regional Spread of Recurrent Respiratory Papillomatosis to Bilateral Cervical Lymph Nodes

Hien T. Tierney, MD, Boston, MA
Harrison W. Lin, MD, Boston, MA
Eric H. Holbrook, MD, Boston, MA
Ramon A. Franco, MD, Boston, MA
Ben Z. Pilch, MD, Boston, MA
Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the presentation of patients with adult onset recurrent respiratory papillomatosis (RRP) and discuss the incidence of regional spread of RRP and management of RRP patients with a new neck mass.

Objectives: To present a rare case of regional spread of recurrent respiratory papillomatosis (RRP) to bilateral cervical lymph nodes. **Study Design:** Case report and a review of the literature. **Methods:** We describe a case of a 47 year old man with adult onset, human papilloma virus type 11 associated RRP involving the supraglottis, oropharynx, nasopharynx and nasal and sinus cavities. The patient required debulking procedures, including laser cytorreduction of epiglottic papillomatosis, endoscopic sinus surgery for sinonasal disease, and electrocautery ablation of tonsillar and soft palate lesions on an annual basis for this nonaggressive variant of RRP. Despite the relatively benign nature of the disease, the patient later developed a right level II neck mass demonstrating nonspecific reactive hyperplasia on fine needle aspiration. Given a previous history of a left level II cervical tumor with pathology consistent with a salivary gland neoplasm, the patient underwent an excision of the mass, and final pathologic analysis revealed an intranodal papillary cystadenoma with foci resembling Schneiderian papillomatosis. **Results:** This histologically benign lesion was noted to closely resemble the pathologies of both the prior neck mass and the biopsies from previous sinus and airway surgeries. A review of the literature reveals this case to be only the third reported instance of papillomatous spread to the neck. **Conclusions:** An unusual case of regional extension of RRP to the neck through the lymphatic system and proliferation of papillomas within cervical lymph nodes is described. Regional spread of papillomas should be considered in RRP patients with a new onset neck mass.

SM34. Giant Cell Tumor of the Larynx: A Case of Malignant Sarcomatous Transformation

Richard J. Vivero, MD, Miami, FL

Sandeep Dave, MD, Miami, FL

Donald T. Weed, MD, Miami, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the epidemiology, pathophysiology, and treatment of giant cell tumor of the larynx.

Objectives: 1) To review the epidemiology, pathophysiology, and treatment of giant cell tumor of the larynx; and 2) to report the first case of malignant transformation of giant cell tumor of the larynx. **Study Design:** Case report. **Methods:** A case of giant cell tumor of the larynx from a tertiary care university teaching hospital is presented, including the patient's clinical course and subsequent treatment. The case is discussed within the context of a review of the current literature regarding this disease entity. To our knowledge, this report represents the first case of malignant transformation of giant cell tumor of the larynx. **Results:** The patient underwent hemilaryngopharyngectomy with radial forearm free flap reconstruction and fifteen cycles of chemotherapy. He remains disease free at approximately 36 months followup. The patient is decannulated and continues to have a good voice with excellent quality of life to this day. **Conclusions:** Our experience demonstrates that giant cell tumor of the larynx may present as a malignant neoplasm without adversely affecting the patient's prognosis when treated aggressively with surgical resection and adjunct chemotherapy.

SM35. Recreation of the Buccal and Lingual Vestibules following Marginal Mandibulectomy

John W. Werning, MD, Gainesville, FL

Glenn E. Turner, DMD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to fabricate a customized mandibular stent that will improve the retention of removable dental prostheses after marginal mandibulectomy.

Objectives: To describe a novel technique that maximizes the depth of the buccal and lingual alveolar vestibules following marginal mandibulectomy for eventual dental prosthetic rehabilitation. **Study Design:** Retrospective case series. **Methods:** A customized acrylic stent, which is fabricated prior to surgery, is relined with a synthetic impression material that duplicates the contours of the remaining mandible and extends to the base of the buccal and lingual vestibules. The resulting stent is relined with a self-polymerizing soft relining material and is stabilized with circummandibular wires. **Results:** In each case, intimate adaptation of the stent to the mandible improved skin graft survival and resulted in alveolar vestibular depths and contours that improved the retention of the removable dental prosthesis. **Conclusions:** Customized stents with vestibular extension maximize skin graft survival and dental prosthetic rehabilitation following marginal mandibulectomy.

SM36. Strategic Placement of Osseointegrated Implants in Orbital Exenteration Defects Prior to Postoperative Radiotherapy (PORT)

John W. Werning, MD, Gainesville, FL

Emma L. Lewis, BDS, Gainesville, FL

William M. Mendenhall, MD, Gainesville, FL

Robert S. Malyapa, MD, Jacksonville, FL

Stephen B. Lewis, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the criteria for and location of osseointegrated implant insertion in orbital exenteration defects that require postoperative radiotherapy.

Objectives: To describe the management considerations that improve the likelihood of implant osseointegration and minimize the risk of osteoradionecrosis in orbital exenteration defects that are scheduled for PORT. **Study Design:** Retrospective case series. **Methods:** Preoperative radiographic assessment of the malignancy is used to estimate the extent of resection and the likely clinical target volume (CTV) required for PORT. Interdisciplinary treatment planning between the surgeon, radiation oncologist, and maxillofacial prosthetist is employed to evaluate the optimal location for osseointegrated implantation. Implants were placed lateral to the midportion of the orbital defect when the proposed CTV contours were limited to the medial orbit. Implants were not inserted if the proposed CTV contours included the lateral portion of the orbit. **Results:** The CTVs could be acceptably contoured so that the lateral orbit would not be irradiated when there was limited tumor extension into the medial portion of the orbit and the orbital apex was free of malignancy. **Conclusions:** Careful interdisciplinary preoperative planning is essential to maximize implant success, minimize the risk of osteoradionecrosis, and optimize prosthetic rehabilitation.

SM37. An Unusual Case of Trismus and Epistaxis

Aaron M. Wieland, MD, Boston, MA
Jeremy D. Richmon, MD, Boston, MA
Stacey T. Gray, MD, Boston, MA
Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the clinical presentation of an infratemporal fossa (ITF) foreign body and discuss the various surgical approaches for removal.

Objectives: Head and neck foreign bodies have a variety of distinct clinical presentations. We present an unusual case of an ITF foreign body requiring operative removal and discuss surgical approaches to this space. **Study Design:** A case report and review of the literature. **Methods:** Case report and Medline search of the terms "infratemporal fossa" and "foreign body". **Results:** A 64 year old male sustained a laceration to his right cheek after a window pane shattered over his head. Plain film x-rays were unremarkable and the laceration was closed primarily. He developed mid-right face weakness, progressive trismus to 1.5 cm and salivary-like drainage from his cheek wound. He also developed intermittent right-sided epistaxis that was exacerbated with chewing. After referral to several dentists and an oral surgeon a CT scan revealed a 5 cm foreign body extending through the superior parotid gland into the ITF terminating in the middle turbinate. Through a modified Blair approach to the parotid gland two glass fragments were removed. Nasal endoscopy was used to visualize the glass imbedded in the middle turbinate. At three months followup he had no trismus and facial nerve function was normal. A review of the literature identified several reports of displaced maxillary molars and traumatic foreign bodies of the ITF. This case is unique in its surgical approach and the concomitant presentation of trismus and epistaxis. **Conclusions:** ITF foreign bodies may present a diagnostic and therapeutic challenge. The surgical approach to removal is dictated by the nature of the injury.

Laryngology-Bronchoesophagology

SM38. A Modified Rabbit Model for the Endoscopic Creation and Study of Benign Tracheal Stenosis

Bryan C. Ego-Osuala, MD, Baltimore, MD
Richard J. Wright, MD, Baltimore, MD
Duane Sewell, MD, Baltimore, MD
Tanya K. Meyer, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should understand the usefulness of the rabbit as a small animal model for the endoscopic study of tracheal stenosis.

Objectives: Benign tracheal stenosis is a difficult treatment dilemma for which an ideal animal model does not exist. This project establishes an endoscopic small animal model of airway stenosis in which a reproducible stenotic lesion is both created and monitored endoscopically with the goal to expand the armamentarium available to treat tracheal stenosis. **Study Design:** Animal experiment. **Methods:** Animals were anesthetized and maintained under spontaneous ventilation with the assistance of the veterinary staff. The animals were placed supine on an inclined ramp with the neck extended and suspension laryngoscopy and bronchoscopy were performed using a pediatric laryngoscope and rigid telescopes. Tracheal lesions were created with electrocautery under endoscopic visualization using a modified electrocautery handpiece with an extended, insulated right angle tip. Cautery was performed around 50% of the tracheal circumference. We returned to the operating room at weekly intervals to evaluate for progression of stenosis by using an endoscopic measuring device. Photodocumentation was performed at each procedure. At the conclusion of the study, animals were euthanized and laryngotracheal complexes harvested. **Results:** Three

weeks after the initial lesioning of the rabbit tracheas we began to see stenosis of up to 30%. By six weeks we had achieved stenoses of 40-60%. During the study, animals were observed daily and did not experience any significant respiratory distress even with maximal stenosis. **Conclusions:** The rabbit is an appropriate endoscopic small animal model for the study of benign tracheal stenosis. We were able to reliably perform direct laryngoscopy and bronchoscopy and successfully created stenotic tracheal lesions in each animal via a transoral, endoscopic approach.

SM39. The Effect of Cidofovir Injection Concurrent with Surgical Resection for Adult Onset Recurrent Respiratory Papillomatosis

John F. Eisenbeis, MD, St. Louis, MO

Joshua M. Sappington, MS, St. Louis, MO (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to compare current treatment protocols for adult respiratory papillomatosis with the described technique of surgical removal and injection of cidofovir into the surgical resection site.

Objectives: A retrospective analysis of a noteworthy treatment protocol for a distinctive group of adult onset recurrent respiratory papillomatosis (AORRP) patients. **Study Design:** Chart review of 21 patients over 14 years. **Methods:** Adult patients with recurrent respiratory papillomatosis were treated when voice symptoms developed at an academic teaching hospital. The papillomatous lesions were resected using a microdebrider technique. In some patients the surgical beds were then injected with cidofovir. Two groups of patients are presented. The first group only received surgical resection without cidofovir. The second group was initially treated with surgical resection and in subsequent procedures underwent resection with injection of cidofovir. The interval between surgeries was determined for each patient. The effect of cidofovir to lengthen the interval between surgeries was noted. **Results:** In this study 15 patients received cidofovir treatment at the time of resection and 6 patients did not receive cidofovir. It should be noted one patient who did not receive cidofovir treatment received and completed interferon therapy and two patients had lesions that underwent malignant transformation. The patients who received cidofovir demonstrated an increased interval before voice symptoms recurred and some patients experienced complete remission. **Conclusions:** This group of patients demonstrates the efficacy of injecting cidofovir in the surgical bed as adjuvant therapy at the time of surgical resection for AORRP. This treatment protocol is comparable to an intralesional injection treatment technique.

SM40. Endoscopic Treatment of Subglottic Stenosis due to Percutaneous Tracheostomy Tube Placement

Benjamin T. Jeffcoat, MD, Jackson, MS

John M. Schweinfurth, MD, Jackson, MS*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss treatment options in patients with subglottic stenosis due to percutaneous tracheostomy tube placement.

Objectives: To determine outcomes and outcome predictors in the repair of subglottic stenosis (SGS) due only to percutaneous tracheostomy tube placement. **Study Design:** Retrospective case series. **Methods:** We included patients with SGS due to placement of a percutaneous tracheostomy tube. Measures included surgical approach, grade of SGS, length of followup, and decannulation status. **Results:** Six patients (4 males, 2 females) met inclusion criteria with an average age of 41.8 years (22-58 years). Five of 6 patients remain decannulated at this time. One patient with grade IV SGS remains tracheostomy tube dependent secondary to pulmonary issues requiring aggressive pulmonary toilet; however, his subglottic airway remains widely patent. Four patients with grade II SGS patients were successfully treated by a single endoscopic dilation. One patient with grade III SGS ultimately required open laryngotracheal resection with primary anastomosis after failing endoscopic dilations. His subglottic airway remains widely patent and he remains decannulated. Average followup for the series is 23.3 months (6 weeks-63 months). **Conclusions:** In our series, SGS due to percutaneous tracheostomy tube placement may be successfully treated endoscopically. Based on our series, we recommend initial endoscopic dilation in grade II/III SGS, reserving open laryngotracheal resection with primary anastomosis for grade IV disease or those cases unresponsive to the more conservative endoscopic approach.

SM41. SECOND PRIZE - HENRY WILLIAMS RESIDENT RESEARCH AWARD Establishment of a Reliable Mouse Laryngeal Transplantation Rejection Grading System

David G. Lott, MD, Cleveland, OH

Olivia Dan, BS, Cleveland, OH

Robert R. Lorenz, MD, Cleveland, OH

Marshall Strome, MD MS, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to determine the degree of

rejection of transplanted larynges in the mouse model.

Objectives: To establish a reliable rejection grading system for the newly developed mouse laryngeal transplant model. The grading system will allow future comparison of various immunosuppressive agents based on rejection status. **Study Design:** Thirty-one mouse laryngeal transplants (C57 BL/6 donors to C3H recipients) were performed and allowed to reject. Six time points were evaluated histologically: 1, 3, 5, 7, 9, and 15 days post-transplant. Eight anatomic sites were evaluated and assigned a point value. **Methods:** A linear regression model was constructed using the group number as the response and the scores from the eight histological criteria as predictors. Severity classifications were determined by observing patterns in the sum of scores of variables found to be significant contributors. Group 1 was considered normal; group 2 as minimal rejection; groups 3, 4, and 5 as moderate rejection; and group 6 as severe rejection. **Results:** Changes in cartilage, fat, and muscle as well as the magnitude of lymphocytic infiltration were the most useful for assessing rejection. The rejection model demonstrated 100% accuracy in predicting the severity classification in the 31 specimens in the study. Predicted group = $4.81 - 0.94 \times (\text{cartilage}) - 0.43 \times (\text{fat}) + 0.40 \times (\text{lymph. infil.}) - 0.69 \times (\text{muscle})$. **Conclusions:** The model established provides an accurate and reliable way to classify rejection severity in mice receiving laryngeal allografts. This sets the stage for future advanced study of manipulating the immune system as a mechanism for establishing tolerance.

SM42. Holmium YAG Laser for Transoral Surgery of the Upper Airways

Tanya K. Meyer, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should have an understanding of the applications available for the Holmium:Yttrium-Aluminum-Garnet (Ho:YAG) laser in upper airway surgery and be able to compare the characteristics of the Ho:YAG laser to other commonly available lasers.

Objectives: The Ho:YAG laser has a fiber based delivery system conducive to use through a channel fiberoptic bronchoscope and some tissue applications similar to the carbon dioxide laser. It is commonly used by urologists for treatment of benign prostate hyperplasia and urolithiasis but has not been well reported in the otolaryngology literature. We describe the successful application of this technology for procedures of the upper airway. **Study Design:** Retrospective clinical series. **Methods:** Six patients underwent surgical treatment of upper airway lesions: 3 obstructing tracheal granulomas, 2 subglottic or tracheal respiratory papillomas, and one patient with benign tracheal stenosis. These patients had either cervical spine disease or other anatomical constraints that mandated the use of flexible fiberoptic technology to expose and treat their lesions. Results and complications were reviewed. **Results:** All patients had successful treatment of their airway lesions. The laser demonstrated coagulative and ablative properties in minimally vascular tissue. The laser is preferentially absorbed by water and thus does not provide the same hemostatic properties as the lasers in the blue-yellow spectrum. There were no complications related to the surgical procedure or to the use of the laser in any patient. **Conclusions:** The Ho:YAG laser is useful for treatment of airway lesions that have minimal to moderate vascularity. It has a shallow depth of penetration which allows for safe use in the thoracic trachea. The flexible fiber delivery system allows delivery through a fiberoptic bronchoscope. The laser is widely available in many surgical centers and should be in the armamentarium of the otolaryngologist.

SM43. Localization of the Muscular Process for Arytenoid Adduction Surgery

Joshua R. Mitchell, BA, Indianapolis, IN

Bryan R. McRae, MD, Indianapolis, IN

Stacey L. Halum, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate an improved ability to accurately locate the muscular process of the arytenoid cartilage during arytenoid adduction surgery.

Objectives: Arytenoid adduction (AA) surgery can be technically challenging. While AA is often performed as an adjunct to thyroplasty type I (TTI) for the management of unilateral vocal fold paralysis, no previous studies have defined the anatomic location of the arytenoid muscular process (MP) relative to the TTI window. The aim of this study was to describe the location of the arytenoid MP relative to the TTI window and other key thyroid cartilage landmarks. **Study Design:** Cadaveric anatomic dissections. **Methods:** The arytenoid MP was identified in eight cadavers bilaterally for a total of 16 hemilaryngeal measurements. The location of the MP was measured relative to the traditional location of the anteroinferior corner of a TTI window and relative to the roots of the superior and inferior cornua. **Results:** In all hemilarynges, the muscular process was located along a line drawn posteriorly from the anteroinferior TTI window and parallel to the inferior border of the thyroid cartilage. In males, the mean distance from the muscular process was 26.9 mm (range 24.5-30 mm) from the anteroinferior corner of the window, while in females the muscular process was located 18.9 mm (range 17-21 mm) from the same starting point. In all cases, the muscular process was located inferior to the midpoint between the roots of the superior and inferior cornua (mean inferior offset = 2.7 mm; range 0.5-8.0 mm inferior to the midpoint). **Conclusions:** The TTI window can be used intraoperatively to help

locate the arytenoid muscular process in arytenoid adduction surgery.

SM44. Acute Airway Obstruction and Persistent Aphonia Due to Achalasia

Patrick D. Munson, MD, Rochester, MN

Jan L. Kasperbauer, MD, Rochester, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the mechanism of acute airway obstruction in achalasia and its management, as well as discuss the various airway symptoms caused by achalasia.

Objectives: To highlight the rare presentation of acute airway obstruction and aphonia due to achalasia; to review airway symptoms that can be caused by achalasia. **Study Design:** A retrospective case review of a single patient that developed acute airway obstruction and persistent aphonia due to achalasia. **Methods:** The history, physical, imaging, endoscopic, and postintervention findings of the patient are reviewed. Otolaryngologic manifestations of achalasia are discussed. **Results:** An 82 year old woman presented to an outside ER with hoarseness and stridor following food ingestion. She had known achalasia and had previously been treated with eight esophageal dilations. CT scan revealed megaesophagus and anterior displacement of the larynx with tracheal compression. Prior to scheduled EGD, she developed acute airway obstruction and underwent emergency tracheostomy. She was then transferred to our facility. Otolaryngology was consulted due to aphonia despite tracheostomy corking. Flexible laryngoscopy revealed massive compression of the larynx with inspiration and impingement of the arytenoids, preventing phonation. Thoracic surgery performed an esophagogastrectomy for her end stage achalasia. Postoperatively, her vocal function returned and the trachea was of normal caliber. Radiologic and flexible laryngoscopic findings will be demonstrated. **Conclusions:** Acute airway obstruction by esophageal dilation is a rare complication of achalasia. This is also believed to be the first case to cause complete aphonia. The otolaryngologist should be aware of the various airway symptoms manifested by achalasia.

SM45. Multifactorial Dysphagia: DISH and Eosinophilic Esophagitis

Grace L. Nimmons, MD, Iowa City, IA

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

Satish S.C. Rao, MD PhD FRCP, Iowa City, IA

Charles R. Clark, MD, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the pathologic findings and treatment of eosinophilic esophagitis and DISH.

Objectives: Review a diagnosis of multifactorial dysphagia. Understand the pathologic findings and treatment of eosinophilic esophagitis and DISH. **Study Design:** Case report. **Methods:** A 60 year old man with 5 years of progressive dysphagia and weight loss was referred to a tertiary care center to address prominent cervical osteophytes associated with diffuse idiopathic skeletal hyperostosis (DISH) as the presumed cause of the dysphagia (Forestier's disease). A large thyroid mass was identified on exam with needle biopsy identifying a follicular neoplasm. Transnasal esophagoscopy (TNE) identified not only mass effect deforming the posterior pharyngeal wall, but also trachealization of the esophagus with luminal narrowing. A modified barium swallow study identified vallecular and pyriform retention with overflow laryngeal penetration. Transoral endoscopy was performed with esophageal dilation and biopsy confirming eosinophilic esophagitis. Medical therapy with oral steroids and proton pump inhibitors failed to improve the dysphagia. Thyroid lobectomy with concurrent resection of C3-C6 osteophytes was then performed. The degree of dysphagia worsened immediately and required nasogastric feedings but gradually improved to the point that four weeks later all intake was tolerated orally. On one year followup, the patient reported improvement in swallowing. **Results:** Dysphagia due to DISH rarely occurs whereas dysphagia due to eosinophilic esophagitis is increasingly common. The diagnosis and treatment of these disorders will be reviewed. **Conclusions:** Multiple factors, including rare etiologies, must be considered in cases of dysphagia. A thorough history and physical exam, ancillary tests such as TNE, and a team approach including orthopaedic surgeons and gastroenterologists were crucial to the appropriate management of this case.

SM46. Office Based Steroid Injection for Chronic Laryngitis and Glottic Stenosis Secondary to Sarcoid

Matthew S. Stevens, BS, Jackson, MS

John M. Schweinfurth, MD, Jackson, MS*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss treatment options in laryngeal sarcoidosis.

Objectives: The objective of this study is to determine outcomes and outcome predictors in the office based treatment of chronic laryngitis and glottic stenosis secondary to chronic inflammatory sarcoidosis. **Study Design:** Retrospective case series. **Methods:** Institutional review approval was obtained. Patients with chronic laryngitis and glottis airway narrowing due to sarcoidosis treated with steroid injections in the office setting were included for study. Patients were treated with staged or concurrent bilateral percutaneous injections of 20mg triamcinolone acetate into each vocal fold via the cricothyroid membrane. Outcome measures include demographics, subjective measures of voice and airway, treatment dosage, intervals, and frequency, vocal recovery, and followup. **Results:** Four medical records were identified which met inclusion criteria. Patients were black females with longstanding sarcoidosis aged 38-45 year (mean 41). Patients presented with chronic dysphonia and dyspnea on exertion. Patients underwent a mean of 2.5 injections over an average of 8 months. Followup was 3-14 months. Following bilateral injection, 3 of 4 patients experienced an immediate, dramatic improvement in voice and airway symptoms of an average of 6 months' duration, while one patient required operative intervention for worsening airway symptoms. **Conclusions:** Sarcoidosis can have devastating effects on the larynx from chronic inflammation and remodeling of glottic and supraglottic structures leading to stenosis and dyspnea. Airway instrumentation to treat stenosis, however, may require prolonged intubation or even tracheotomy due to transient edema, while chronic, systemic steroids have significant side effects. Office based steroid injection is a viable alternative to operative intervention and may avoid the need for prolonged intubation and tracheotomy.

SM47. A Complication of Injection Laryngoplasty Using Radiesse

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Dale C. Ekbohm, MD, Nashville, TN

I-Fan T. Mau, MD, Nashville, TN

Robert H. Ossoff, DMD MD, Nashville, TN*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss possible complications following injection laryngoplasty with Radiesse and potential management options.

Objectives: In the treatment of unilateral impairment of vocal fold motion and glottic insufficiency, an injectable form of calcium hydroxylapatite (Radiesse) has shown some promise in true vocal fold augmentation secondary to its inert properties and long-term stability. We present a complication of significant vocal fold scarring following injection with Radiesse. To our knowledge, photodocumentation of this complication has not been reported. **Study Design:** Case report. **Methods:** A 45 year old male presented to a community-based otolaryngologist with a four year history of hoarseness. Fiberoptic laryngoscopy revealed mild, bilateral atrophy of the true vocal folds with incomplete closure. The patient underwent bilateral true vocal fold injection laryngoplasty with Radiesse. He continued to have a breathy voice postoperatively. Three months after the first injection, bilateral injection laryngoplasty with Radiesse was repeated. Following this operation, the patient's voice became significantly worse. He presented to our center where videostroboscopy revealed significant loss of mucosal wave. There was evidence of calcium hydroxylapatite bilaterally within the superficial lamina propria of the true vocal folds. **Results:** We cared for this patient conservatively using a combination of medical management, voice therapy and serial videostroboscopy. Over a period of fourteen months, his voice improved and videostroboscopy showed partial resorption of the Radiesse. **Conclusions:** This is a unique complication following injection laryngoplasty with Radiesse. Our treatment illustrates that this complication can be treated conservatively. There is at least partial resorption of Radiesse which is documented photographically in this report. However, given the evidence in prior studies regarding calcium hydroxylapatite's long term stability, complete resorption of Radiesse would not be expected.

SM48. Rare Presentation of Hoarseness: Laryngeal Oncocytic Cystadenoma

Creighton C. Vaught, MD, Augusta, GA

Neil N. Chheda, MD, Gainesville, FL

Timothy P. Seybt, MD, Augusta, GA

Gregory N. Postma, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the entity of laryngeal oncocytic cystadenoma and include it in their differential diagnosis of laryngeal lesions.

Objectives: To understand the entity of the rare laryngeal oncocytic cystadenoma and know the typical clinical and pathological presentation of these tumors. **Study Design:** Case report. **Methods:** Case report detailing patient's initial presentation, imaging, and surgical treatment leading to diagnosis of laryngeal oncocytic cystadenoma. Additionally a comprehensive search of the medical literature was performed. **Results:** A seventy-three year old female presented to our tertiary laryngology office with a one year history of progressive hoarseness. Past history revealed she was a nonsmoker with a history of hypertension, gout, and GERD. A CT scan of the neck revealed a soft tissue mass at the base of epiglottis along the internal surface of the thyroid cartilage. Direct transnasal fiberoptic laryngoscopy revealed a fullness in the left supraglottis with an irregular appear-

ance of the left hemilarynx. Suspension microlaryngoscopy with marsupialization of supraglottic cyst was performed with the pathology consistent with laryngeal oncocytic cystadenoma. **Conclusions:** Laryngeal oncocytic cystadenomas are rare entities with less than 200 being reported in the literature. They most commonly present in the supraglottis (74%), have a female preponderance and present in the seventh and eighth decades of life. Presenting symptoms have ranged from incidentally noted on routine examination to fatal airway obstruction. Laryngeal oncocytic cystadenomas, while an unusual and benign condition of the larynx, should be considered during the workup of patients with unusual appearing laryngeal lesions.

SM49. Predictors of Clinically Aggressive Recurrent Respiratory Papillomatosis

Paul M. Weinberger, MD, Augusta, GA
Philip K. Robb Jr., BA, Augusta, GA
Hans T. Carlson, BS, Augusta, GA
Helen Perakis, MD, Augusta, GA
Jason P. McChesney, MD, Augusta, GA
Gregory N. Postma, MD, Augusta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the epidemiology and pathophysiology of recurrent respiratory papillomatosis (RRP), and relate these to possible predictors of clinically aggressive disease.

Objectives: To determine predictive factors for clinically aggressive recurrent respiratory papillomatosis (RRP). **Study Design:** Retrospective cohort study at a tertiary academic medical center. **Methods:** Patients (adults and children) treated for RRP from 1998 to 2008 were identified using billing data and procedure logs. Cases were dichotomized into clinically aggressive versus nonaggressive disease. Aggressiveness was defined as: undergoing more than four procedures in twelve months, distal spread of disease, or transformation to squamous cell carcinoma. **Results:** Forty-four patients with RRP were identified. Age ranged from 4 months to 81 years old with 6 pediatric and 38 adult patients. There were 22 males and 22 females. Maximum number of surgical procedures in one year ranged from 1 to 13 (mean 3.4). Six patients had distal spread of disease and one suffered malignant transformation. Thirteen patients had aggressive disease and 31 patients had nonaggressive disease. Five patients had asthma. Pediatric patients were more likely to have aggressive disease (67% versus 24%, $p=0.05$). There was no association between GERD and aggressive disease, however patients not on PPI therapy were more likely to have aggressive disease (62% versus 16%, $p=0.009$). There was a strong association between asthma and aggressive RRP, with 100% of asthma patients having aggressive disease versus 21% of non-asthma patients ($p=0.001$). **Conclusions:** Asthma is associated with aggressive clinical course for RRP. Additional predictors of aggressive disease include lack of PPI use and pediatric disease onset. Patients with asthma may warrant closer clinical followup, and possible etiologic explanations for this finding are currently being investigated in our laboratory.

SM50. Tracheal Stenosis Induction: A Comparison of Open versus Endoscopic Methods in a Rabbit Model

Benjamin J. Wycherly, MD, Washington, DC
Hosai N. Hesham, MD, Arlington, VA
Sonya Malekzadeh, MD, Washington, DC
Matthew K. Steehler, MD, Washington, DC
Kevin M. Burke, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate the value of an endoscopic method of inducing tracheal stenosis in a rabbit model.

Objectives: Compare the induction of tracheal stenosis by an endoscopic versus an open method. **Study Design:** Prospective animal study. **Methods:** Fifteen adult male New Zealand white rabbits underwent induction of tracheal stenosis. Six animals received mucosal injury directly through a tracheotomy and 10 strokes of a nylon brush. Nine animals received tracheal injury endoscopically: a rigid bronchoscope was placed a measured distance below the inferior edge of the cricoid cartilage and a nylon brush was passed 4 times in each of the 4 quadrants. Endoscopies were performed 3 weeks after injury. Stenosis was measured as a percentage of luminal narrowing by a consensus of 3 individuals viewing the procedure on a television monitor. **Results:** Only 1 animal in the tracheotomy group had noticeable stenosis (40%). In the endoscopic group, all animals had some degree of stenosis, ranging from 10-80% (mean 40%). The mortality rate was 20% (3/15). In the tracheotomy group, 1 mortality occurred secondary to antibiotic-induced gastroenteritis. In the endoscopic group, 2 mortalities occurred in the immediate postoperative period secondary to laryngeal edema. These 2 animals were the first to undergo the procedure, which lasted approximately 30 minutes. After refining our technique, succeeding procedures lasted an average of 5 minutes and there were no mortalities. The average duration of the tracheotomy procedure was 45 minutes. **Conclusions:** Using an endoscopic method can greatly improve the induction of tracheal stenosis by reducing operative time and eliminating an open wound and

the need for antibiotics. It also achieves stenosis more consistently than an open technique.

Otology/Plastics-Aesthetics/General

SM51. Clinical Presentation of Patients Undergoing a Minor Salivary Gland Biopsy for Sjogren's Syndrome

Ravinder Bamba, BA, Chicago, IL
Nadera J. Sweiss, MD, Chicago, IL
Alexander J. Langerman, MD, Chicago, IL
Jerome B. Taxy, MD, Chicago, IL
Elizabeth A. Blair, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the clinical situations when a lip biopsy would be beneficial for diagnosis and treatment of Sjogren's syndrome. Participants should also be able to discuss why a lip biopsy can be unnecessary in certain clinical cases.

Objectives: In suspected cases of Sjogren's syndrome (SS), patients are often referred for a labial minor salivary gland biopsy. However, studies have shown this test to be unreliable. Pathologic misinterpretation and immunosuppressive medications may affect the results of the biopsy. As a result, it is best to perform this procedure only when necessary. The purpose of the current study was to review clinical signs and symptoms of patients who underwent a lip biopsy to determine which patients most benefited from this procedure. **Study Design:** Retrospective review. **Methods:** A retrospective chart review of patients referred to otolaryngology for a lip biopsy for the diagnosis of Sjogren's syndrome. **Results:** Joint pain, salivary gland swelling, and abnormal serology (anti-SSA/anti-SSB) were more prevalent in the positive lip biopsy group (grade=3 or 4). Out of the 12 patients who had both sicca symptoms and positive serology, nine (75%) had a grade=4. Presence of sicca symptoms and positive serology were predictive of a positive biopsy ($p=.017$). Excluding those patients who were on immunosuppression for more than six weeks prior to the biopsy, the correlation became stronger ($p=.011$). **Conclusions:** In this study, clinical presentation of sicca symptoms and positive serology reliably predicted the results of a lip biopsy. The results of this study suggest that patients with clear criterion for SS may not require a lip biopsy, especially those patients on immunosuppression. When physicians suspect SS, a thorough clinical and laboratory examination is necessary in order to determine if a patient will benefit from a minor salivary gland biopsy.

SM52. Nasal Injuries in Athletes

C. Ron Cannon, MD, Flowood, MS*
Rob M. Cannon, BS, Brandon, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to know the demographics and mechanisms of injury, as well as treatment strategies for athletes with nasal injuries.

Objectives: Evaluate nasal injuries as to sex, age, sport, injury mechanism, concomitant injuries, treatment results and return to sports activity. **Study Design:** Prospective, observational study of patients seen in a private practice clinic for evaluation of head and neck injuries incurred in athletic endeavors. **Methods:** Patients seen in a clinic setting for evaluation ($n=94$). Note made of demographics, sport and mechanism of injury, physical exam and radiographic findings. Also studied are treatment options, outcomes, and return to sports activity. **Results:** There are a significant number of injuries in women (30%) and in non-contact sports. The sport most commonly implicated is basketball, followed by baseball, football and soccer. If surgery is required a closed reduction of nasal fracture is most commonly employed. **Conclusions:** Nasal injuries are common in a number of different sports, most of the injuries are not preventable. The injuries tend to occur in organized activities at higher levels of competition. The majority of those injured are able to return to their sport (92%).

SM53. The Accuracy of Preoperative CT Scans in Predicting Cholesteatoma in Revision Tympanomastoidectomy

Adam M. Cassis, MD, Morgantown, WV
Stephen J. Wetmore, MD, Morgantown, WV*
Thomas D. Roberts, MD, Morgantown, WV

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the use of preoperative CT scan in planning revision tympanomastoidectomy.

Objectives: To assess the efficacy of preoperative computed tomography scans in patients undergoing revision tympanomastoidectomy for cholesteatoma. **Study Design:** Retrospective review of CT scans and operative reports in patients undergoing

revision tympanomastoidectomy for cholesteatoma. **Methods:** Radiologic criteria (soft tissue density, well defined mass, soft tissue bands, air sac, CT score) were recorded for each preoperative CT scan and then compared to actual operative findings and pathology results. **Results:** Forty-one patients who had preoperative CT scans performed at our facility who also underwent surgery for cholesteatoma were reviewed. The average age was 27 with a range from 6 to 79. There were 25 males and 16 females. Average time from CT scan to surgery was 25 days. We compared certain radiologic findings to intraoperative findings of cholesteatoma to determine the efficacy of CT in diagnosing cholesteatoma. The positive predictive values for specific radiologic criteria were 92% for a well defined mass, 82% for air sac, 86% for soft tissue bands, and 88% for overall impression of CT scan, although the negative predictive values were 21%, 17%, 18%, and 27% respectively for those criteria. No individual radiologic finding showed statistical significance, and overall CT score correlated poorly with intraoperative findings. **Conclusions:** Preoperative CT scan for revision tympanomastoidectomy correlated poorly with intraoperative findings of cholesteatoma. Second look tympanomastoidectomy remains the gold standard for diagnosis of cholesteatoma in patients with previous mastoid surgery.

SM54. Surgical Anatomy of the Cochlea

Vinaya K. Chakradeo, MD, Shreveport, LA
Gale L. Gardner, MD, Shreveport, LA*

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the anatomical details of the basal turn of the cochlea and to discuss the optimal site of cochleostomy for cochlear implant surgery.

Objectives: The goal of this study was to identify the external landmarks that serve as a guide to the internal structures of the basal turn of the cochlea to facilitate easy insertion of the electrode in the scala tympani during cochlear implant surgery. **Study Design:** It is very important to know the details of the cochlear anatomy for successful cochlear implantation. We now know that the selective placement of the electrode in the scala tympani helps to preserve residual hearing. The review of literature showed that there has been no consensus on the optimal site of cochleostomy. **Methods:** Six cadaveric temporal bones were used to study the anatomical details of the round window niche, round window membrane, osseous spiral lamina, the hook region of the cochlea and the crista fenestra. Six other temporal bones were used to perform the cochleostomy and then the overlying bone was drilled away to verify the correct placement in the scala tympani. **Results:** The ideal site for cochleostomy was noted to be anteroinferior to the round window membrane. We also recommend removing the crista fenestra to obtain a good angle for placement of the electrode. The anterior portion of the round window membrane was noted to be the most important landmark for performing the cochleostomy. **Conclusions:** This surgical anatomy of the cochlea will facilitate atraumatic insertion of the cochlear implant in the scala tympani thus avoiding damage to the critical structures inside the cochlea.

SM55. Algorithm for the Repair of Cheek Defects

Sivakumar Chinnadurai, MD, Rochester, MN
Eric J. Moore, MD, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to choose an appropriate reconstructive flap based on the extent of the cheek defect to optimize form and function.

Objectives: Defects of the cheek present the reconstructive surgeon with both cosmetic and functional challenges. These defects can range from simple buccal mucosal deficits to composite defects of the mandible, lips and full thickness cheek, each of which present additional levels of complexity. To best treat these patients, facial reconstructive surgeons should have access to a standardized defect algorithm that can aid in planning and executing reconstruction with successful outcomes. The objective of this study is to create such an algorithm. **Study Design:** Retrospective review of patients who were treated in the department of otorhinolaryngology. **Methods:** Retrospective chart review was performed of cheek reconstruction patients. Sample patients were identified by successful functional and cosmetic repairs of the gamut of cheek defects including single layer defects, full thickness defects, full thickness with lip involvement and composite defects involving the mandible. **Results:** Patients involved in this study were treated in accordance with the cheek defect algorithm and achieved excellent functional and cosmetic results. **Conclusions:** Decision making in repair of cheek defects can be simplified with application of an algorithm based on complexity of the wound.

SM56. Facial Nerve Results in Large Vestibular Schwannoma Surgery

Calhoun D. Cunningham III, MD, Raleigh, NC
John T. McElveen Jr., MD, Raleigh, NC*
Takanori Fukushima, MD, Raleigh, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) determine facial nerve outcomes following the surgical removal of large vestibular schwannomas; and 2) understand the indications and implications of

surgical treatment of large vestibular schwannomas.

Objectives: 1. To determine facial nerve outcomes following the surgical removal of large vestibular schwannomas; and, 2) understand the indications and implications of surgical treatment of large vestibular schwannomas. **Study Design:** Retrospective case review. **Methods:** Retrospective case review of fifty patients undergoing surgical removal of large vestibular schwannomas measuring 3.0 cm or greater in size between October 1995 and July 2006 at a tertiary referral neurotologic center. Size, completeness of tumor removal, and 1 year postoperative facial nerve outcomes were assessed using the House-Brackmann facial nerve grading scale. **Results:** The mean tumor size was 3.5 cm. Gross total tumor removal was achieved in 76% of patients with near-total or subtotal resections elected intraoperatively in 12 patients. The facial nerve was preserved anatomically in 49 patients. One year postoperative facial nerve results demonstrated House-Brackmann grade I or II function in 92% of patients. **Conclusions:** Microsurgical resection remains the treatment of choice for large vestibular schwannomas. Excellent facial nerve outcomes can be obtained in the majority of patients with minimal morbidity. Emphasis should be placed on preservation of facial nerve function, and in select cases, alternative treatment strategies may be employed to improve facial nerve outcomes.

SM57. Presentation of Fungal Mastoiditis in a Series of Immune Intact Adults

Jennifer L. Daigle, MD, New Orleans, LA
Moises A. Arriaga, MD, Pittsburgh, PA*

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the spectrum of manifestations of fungal otitis media and mastoiditis as well as its treatment and potential morbidity.

Objectives: Through evaluation of four patients treated in our practice we plan to describe the spectrum of manifestations of fungal otitis media and mastoiditis as well as its treatment and potential morbidity. **Study Design:** While fungal infections of the external auditory canal are common, manifestations in the middle ear have been rarely described in immunocompetent patients. We present a series of four patients with culture positive fungal mastoiditis who have no evidence of immune deficiency to characterize the presentation, disease course, treatment and morbidity of the disease process. **Methods:** A retrospective review was performed of four patients who were diagnosed with fungal mastoiditis and treated at our institutions during the period from 2006 to 2008. **Results:** All four of the patients presented with complaints of chronic otorrhea and hearing loss and had been previously treated with topical and/or oral antibiotics. Although CT scans revealed middle ear and mastoid tissue opacification suggestive of cholesteatoma, upon surgical exploration findings included inflammatory tissue without cholesteatoma. The spectrum of disease severity ranged from only an isolated fungal myringitis to a more aggressive process with bony destruction on CT scan. Treatment ultimately included surgical debridement in each patient as well as systemic antifungal therapy in three of the patients to achieve resolution of the symptoms. Despite resolution of the fungal infection hearing only partially improved in one patient and was not recovered in one of four patients. **Conclusions:** This series of patients illustrates a spectrum of the presentation of middle ear fungal infections which all required aggressive surgical and medical therapy to prevent serious complications. Although uncommon, one should have fungal otitis on the differential in any chronic otitis that has not responded appropriately to antibiotic therapy.

SM58. Acute Blunt Temporal Bone Trauma: A Review of 227 Patients and Discussion on Utility of the Maxillofacial CT for Identifying Carotid Canal Fractures

Ryan D. Dempewolf, MD, Iowa City, IA
Marlan R. Hansen, MD, Iowa City, IA*
Samuel P. Gubbels, MD, Iowa City, IA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the controversy surrounding screening of blunt temporal bone trauma patients for carotid artery injury and know the ability of a maxillofacial CT to identify carotid canal fractures as compared to a temporal bone CT.

Objectives: To evaluate the radiographic workup of blunt temporal bone trauma and determine the utility of maxillofacial CT versus temporal bone CT in identifying carotid canal fractures. **Study Design:** Retrospective review. **Methods:** The charts of 227 patients evaluated at a level I trauma center receiving a temporal bone CT for suspected blunt head trauma within 48 hours of admission were reviewed. Acute evaluation findings and complications were noted. Sensitivity, specificity, PPV and NPV were calculated for a maxillofacial CT's ability to identify carotid canal fractures compared to temporal bone CT. **Results:** 140 fractures were found. Physical exam findings of blood in the EAC as the sole finding and blood in the EAC with associated hemotympanum were significantly associated with absence and presence of fracture respectively. The sensitivity and specificity of maxillofacial CT for identifying carotid canal fractures when compared to temporal bone CT were 90.3% and 94.4% respectively (NPV >95%). Only 6% of all patients either did have or should have had their management changed based on the temporal bone CT findings. All of these changes were regarding further workup for possible blunt carotid artery injury. **Conclusions:** A combination of HCT and physical exam findings can allow for judicious use of temporal bone CT's when no

maxillofacial CT is indicated. Temporal bone CT's rarely change acute management. But, when they do, it is in regard to the need for further workup of possible vascular injury. Lastly, maxillofacial CT's are just as good as temporal bone CT's in identifying carotid canal fractures.

SM59. Otolaryngology in US Medical Schools: Are Students Underexposed?

Jess K. Dhaliwal, MD, Rochester, MN
Amy L. Weaver, MS, Rochester, MN
Laura J. Orvidas, MD, Rochester, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) appreciate the number of hours dedicated to OTO training during medical school and reasons why students select the specialty; and 2) recognize the need for increased advocacy by otolaryngologists for formal training in medical school curricula.

Objectives: Determine the number of hours dedicated to formal OTO training in US medical schools and to discover the aspects of this experience that influence the decision to pursue an OTO residency. **Study Design:** Voluntary survey conducted from 2000 to 2007. **Methods:** A voluntary survey was given to US medical students interviewing for OTO residency at our institution from 2000 to 2007. Applicants were asked about the number of clinical and didactic hours devoted to OTO training, as well as the factors that most influenced the decision to pursue an OTO residency. **Results:** Responses were obtained from 176 students. Many respondents reported no clinical OTO exposure during the first (Y1) and second (Y2) years of medical school (51% and 31%, respectively). Based on the 2007 students, the median hours of clinical OTO exposure was 2 hours in Y1 and 1.5 hours in Y2. Likewise, 38% and 20% of respondents also denied any didactic OTO training during Y1 and Y2, respectively. Less than one-fifth (15%) reported a formal OTO course during Y2. During the third or fourth years, 97% reported having clinical OTO rotations, with 77% of these being elective. Clinical rotations in OTO were cited by 69% of respondents as an aspect of medical training that influenced their decision to pursue an OTO residency. **Conclusions:** This report highlights how many medical students have little to no exposure to OTO in the first two years of medical school. Most clinical exposure is elective. Given these findings, efforts should be made to increase the presence of OTO in medical school curricula and allow all students to be exposed to our specialty.

SM60. Frequency Tuning of Bone Conducted Tone Burst-Evoked Myogenic Potentials in Extraocular Muscles (BOVEMP) in Normal Human Subjects

Kimberly A. Donnellan, MD, Jackson, MS
Thomas L. Eby, MD, Jackson, MS*
Wu Z. Zhou, PhD, Jackson, MS
William B. Mustain, PhD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to characterize the frequency tuning properties of BOVEMP in normal hearing subjects and compare its results to other similar studies.

Objectives: In this study, we investigated the origins of bone conducted sound evoked myogenic potentials in human extraocular muscles (BOVEMP) by characterizing its frequency tuning properties. **Study Design:** Case series. **Methods:** In a sample of 12 subjects, acoustic tone bursts with frequencies from 250 Hz to 2000 Hz were delivered to the subjects by a bone conductor rested on their left mastoid processes. Using surface electrodes, the BOVEMPs were recorded at four locations around the right eye and were referenced to a C7 electrode. Signals from electrodes were amplified and sampled at 10 kHz and were averaged over 300 repetitions. **Results:** Similar short latency biphasic BOVEMPs were observed in the four locations. The average latency of the first and second peak was 15.7+0.3ms and 23.3+0.5ms, respectively. The best frequency that evoked the largest amplitude was 383+17Hz for the first peak and 440+22Hz for the second peak. **Conclusions:** Since the best frequency for the BOVEMP was close to the myogenic responses recorded at the sternocleidomastoid muscles (SVEMP) (350Hz), we hypothesize that the BOVEMP and SVEMP are generated by activation of the same set of vestibular end organs that include the sacule.

SM61. MicroRNA Regulation of Cholesteatoma Growth

David R. Friedland, MD PhD, Milwaukee, WI
Rebecca Eernisse, BS, Milwaukee, WI
Christy Erbe, BS, Milwaukee, WI
Nidhi Gupta, MD, Milwaukee, WI
Joseph A. Cioffi, PhD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation the participants should be able to explain protein regulation by

microRNAs and discuss the potential for human microRNA-21 dysregulation in cholesteatoma proliferation.

Objectives: The goal of this study was to identify novel regulatory mechanisms controlling the growth and proliferation of cholesteatoma. Specifically, the potential role of microRNAs, regulators of protein translation, was studied in cholesteatoma. **Study Design:** This study represents a molecular biological investigation characterizing and comparing microRNA and protein expression in cholesteatoma and normal postauricular skin. **Methods:** Cholesteatoma and normal skin were taken from patients at the time of surgery (n=4). Tissue was processed for RNA and protein extraction. Real time RT-PCR was used to assess levels of human microRNAs in both samples. Western blot analyses were used to assess levels of the microRNA target proteins PTEN and PDCD4. **Results:** Human microRNA-21 (hsa-mir-21) showed a 3.4-fold higher expression in cholesteatoma as compared to normal skin (p=0.009). The downstream targets of hsa-mir-21, PTEN and PDCD4, were found to be correspondingly reduced in cholesteatoma. The reduction in these proteins was approximately twofold. A proposed activator of hsa-mir-21 expression, STAT3, was also differentially expressed between normal skin and cholesteatoma tissues. **Conclusions:** MicroRNAs represent powerful regulators of protein translation and their dysregulation has been implicated in many neoplastic diseases. This study specifically identified upregulation of hsa-mir-21 and downregulation of the potent tumor suppressor proteins PTEN and PDCD4. These proteins control aspects of apoptosis, proliferation, invasion and migration. The results of this study define a model explaining cholesteatoma growth through microRNA dysregulation. MicroRNA regulators provide novel pharmacological targets for the adjunctive or primary treatment of cholesteatoma.

SM62. Petrous Apex Cholesterol Granuloma Associated with Glomus Jugulare

Selena E. Heman-Ackah, MD MBA, Minneapolis, MN
Tina C. Huang, MD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) review the case of a patient that had a cholesterol granuloma in association with a glomus jugulare tumor; and 2) understand the potential related pathogenesis.

Objectives: We report the unique finding of petrous apex cholesterol granuloma associated with glomus jugulare. **Study Design:** Case report. **Methods:** Report of a patient treated for a petrous apex cholesterol granuloma 20 years prior to presentation with a glomus jugulare tumor. The pathogenesis of cholesterol granulomas and possible pathophysiology in relationship with glomus jugulare tumors will be discussed. **Results:** At the time of initial presentation, glomus jugulare was not detectible on examination or CT scan. However, it is likely to have been present at initial presentation. Microscopic bleeding from the glomus jugulare may have led to the formation of the cholesterol granuloma. **Conclusions:** These findings indicate the potential association of glomus jugulare with the formation of cholesterol granulomas of the petrous apex.

SM63. Wide Decompression of Facial Neuromas: An Alternative to Surgical Excision

Bjorn S. Herman, MD, Miami, FL
Simon I. Angeli, MD, Miami, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the treatment options for facial neuromas.

Objectives: When facial neuromas are incidentally discovered or present with limited facial nerve dysfunction, they present a dilemma for the neurotologic surgeon. Excision of facial neuromas nearly always results in facial paralysis of House-Brackmann grade III/VI or higher, even with primary nerve anastomosis or grafting, or if nerve fiber preservation is accomplished. Thus, when treating facial neuromas, wide decompression of the tumors should be considered as an alternative. This constitutes removing bone around the tumor and nerve both distal and proximal to the tumor, and it can lead to long term preservation of function. This presentation reviews our experience with wide decompression of facial neuromas and discusses the various treatment options. **Study Design:** We performed a retrospective review of patients with the diagnosis of facial neuroma between 2002 and 2007. **Methods:** Two patients had facial neuromas discovered intraoperatively during cholesteatoma removal. Two patients presented with facial nerve dysfunction. Wide decompression of the two facial neuromas discovered intraoperatively was performed during the procedure. One patient with extensive facial nerve dysfunction opted for excision and nerve grafting, while the other patient with facial paralysis decided upon wide decompression. **Results:** Average followup was 38.5 months. Facial nerve function remained stable or improved in all patients. The three wide decompression patients maintained preoperative speech reception thresholds, whereas the excision patient experienced a worsening of the SRT. **Conclusions:** Wide decompression should be considered as an option for patients with facial neuromas, especially those who have HB grade I-III facial nerve function, wish to maintain hearing, or have the lesion diagnosed intraoperatively.

SM64. Severe Nasal Frostbite Injury from Supplemental Nasal Cannula Oxygen Malfunction

Noel Jabbour, MD, Minneapolis, MN

Selena E. Heman-Ackah, MD MBA, Minneapolis, MN

Rick M. Odland, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe a potential complication of nasal cannula supplemental oxygen administration not previously reported in the literature; 2) describe management techniques; and 3) discuss the physical properties of compressed oxygen release as related to the injury.

Objectives: To describe a complication of nasal cannula supplemental oxygen, to describe potential methods of treating its resultant injury and to discuss the physical properties of compressed oxygen release as related to the injury. **Study Design:** Case report. **Methods:** Medical records from a female over the age of 90 years who sustained severe frostbite injury from malfunction of supplemental nasal cannula oxygen were reviewed. Photos of injury will be provided. **Results:** Severe injury to the anterior nasal cavity, nasal ala, columella and nasal dorsum with associated significant bilateral periorbital and nasolabial edema were sustained. Necrotic tissue was debrided operatively under local anesthesia with monitored anesthesia care. Serial dressing changes with silver sulfadiazine and stenting of the nasal passage with silastic stenting were utilized in the postoperative period. The patient, however, succumbed to cardiopulmonary disease for which she was on chronic supplemental oxygen eight days postoperatively. A discussion of the physical properties of compressed oxygen gas will be provided. **Conclusions:** Malfunction of supplemental oxygen at high volumes may be associated with a severe frostbite type injury. These lesions may be managed similarly to classic frostbite injuries with debridement and wound cares.

SM65. Auditory Tube Angle and Mastoid Size

Elina Kari, MD, Atlanta, GA

Norman Wendell Todd, MD*, Atlanta, GA

Educational Objective: At the conclusion of this presentation, the participants should be able to have a better understanding of the relationship between the angle of the external auditory canal and mastoid size as a measure of chronic otitis.

Objectives: To check whether the “auditory tube angle” indeed is more nearly straight in ears with evidence of childhood otitis media. **Study Design:** Forty-one bequeathed adult crania underwent computer tomography (CT) scans. The angle of the auditory tube angle was measured in relationship to the measured mastoid size on CT scan. Two independent measurements were obtained and compared. **Methods:** Of 41 bequeathed adult crania without clinical otitis, the five with the largest mastoids and the five with the smallest mastoids, had computed tomography referencing the Frankfort horizontal plane. Two observers independently assessed the angles and distances from sigmoid sinus to bony external meatus. Mastoid size was assessed by two independent techniques: area of pneumatization on Law lateral radiographs; distance from sigmoid to bony external meatus. **Results:** Auditory tube angles did not correlate with mastoid size. Variations in auditory tube angles and distances from sigmoid sinus to bony meatus were found in adjacent CT slices. **Conclusions:** These data do not support the idea that the eustachian bony lumen and external auditory canal meet more nearly straight in ears with evidence of childhood otitis media.

SM66. Tympanostomy Tubes in Patients with Cochlear Implants

Jessica L. Kulak, MD, Miami Beach, FL

Kevin D. Brown, MD, Miami, FL

Fred F. Telischi, MD*, Miami, FL

Thomas J. Balkany, MD*, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the indications for use of tympanostomy tubes in patients with cochlear implants and learn that tympanostomy tubes do not increase the risk of complications in patients with cochlear implants.

Objectives: The purpose of the study is to assess the outcomes and complications that occur in patients that have cochlear implants and tympanostomy tubes. **Study Design:** Retrospective chart review. **Methods:** A retrospective chart review of pediatric patients that have cochlear implants and tympanostomy tubes placed either before or after cochlear implantation. Patients were identified by billing codes from 1999-2007. **Results:** The incidence of otitis media decreased after cochlear implantation. There were no cochlear implant related complications in this case series. The complications that occurred were tube related. There was no incidence of meningitis in this population. There were four hospitalizations, all related to an episode of acute otitis media that required intravenous antibiotics. **Conclusions:** Otitis media will continue to occur in this pediatric age group. As demonstrated in this study, tympanostomy tubes appear to be safe and do not increase the incidence of cochlear implant related

complications.

SM67. Cochlear Implant Surgery in the Chronic Draining Ear

Sam J. Marzo, MD, Maywood, IL
John P. Leonetti, MD, Maywood, IL
Timothy J. Hughes, MD, Maywood, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the evaluation and management of patients with chronic draining ears and deafness requiring cochlear implantation.

Objectives: The objective of this presentation is to discuss the evaluation and management of patients with chronic otitis media and cholesteatoma who are newly deafened and require cochlear implantation. **Study Design:** Retrospective. **Methods:** A chart review was performed on all patients seen in a tertiary referral center between July 1999 and July 2008. Patients who were newly deafened and had a chronic draining ear were selected for this study. All patients underwent surgical treatment. **Results:** Three patients met the criteria for this study. All three patients were newly deafened secondary to complications of chronic otitis media. The average age of the patients was 77. One patient had chronic otitis media and the other two had cholesteatoma. All patients underwent a canal wall down tympanomastoidectomy with oversewing of the ear canal followed by a staged second procedure with cochlear implant in the ipsilateral ear three months later. There were no postoperative complications and all patients are successful users of their implants. **Conclusions:** Staged chronic ear and cochlear implant surgery in patients with new onset deafness in the context of chronic otitis media and cholesteatoma may prevent infection of the cochlear implant device.

SM68. Hypocalcemia after Minimally Invasive Thyroidectomy

Doug D. Massick, MD, Columbus, OH
Matthew C. Garret, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the incidence of hypocalcemia after minimally invasive thyroidectomy.

Objectives: This study reviews our experience with postoperative hypocalcemia after minimally invasive thyroidectomy. **Study Design:** Between July of 2006 and June of 2008 a prospective study was performed to evaluate the incidence of postoperative hypocalcemia in patients undergoing minimally invasive thyroidectomy. **Methods:** Prospective nonrandomized study. **Results:** 168 patients underwent thyroid surgery during the study period. 74 of these surgeries were performed through a 3 cm incision. Postoperative hypocalcemia occurred in 14 patients (18%), of which 5 patients required supplementation with calcium and vitamin D for at least two weeks in the postoperative period to regain normal calcium status. The performance of minimally invasive total thyroidectomy was significantly predictive of postoperative hypocalcemia in univariate analysis. **Conclusions:** Minimally invasive thyroidectomy is associated with a low rate of postoperative hypocalcemia comparable to that reported previously after standard thyroidectomy.

SM69. The Incidence of Biofilms on Adult Tracheostomy Tubes

Danny M. Meslemani, MD, Detroit, MI
Kathleen L. Yaremchuk, MD, Detroit, MI*
Michael Rontal, MD, Farmington Hills, MI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss development of biofilms on tracheostomy tubes, the location that the biofilms are found at and the importance of biofilms in formation of granulation tissue.

Objectives: To demonstrate the presence and location of bacterial biofilms on adult tracheostomy tubes. Specimens were taken at different locations on the tracheostomy tubes and at different times after insertion. **Study Design:** Seven adult tracheostomy tubes were examined for the presence of biofilms at the location of the cuff, if present, and the posterior aspect of the outer cannula of the tracheostomy tube. The specimens were collected during routine tracheostomy tube change. **Methods:** Seven tracheostomy tubes had 2-3 mm samples taken from the posterior aspect of the outer cannula and three cuffed tracheostomy tubes had samples taken additionally from the cuff to test for the presence of biofilms by scanning electron microscopy. **Results:** Bacterial biofilms were found to be present on four adult tracheostomy tubes. Biofilms were found on a cuffed tube that had been inserted 10 days previously and on 3 outer cannulas of uncuffed tubes that had been inserted 14 days, 4 months, and 2 years previously. The biofilms were composed of gram-positive cocci in pairs consistent with staphylo-

coccus epidermidis. **Conclusions:** Bacterial biofilms are present on adult tracheostomy tubes. Both cuffed and cuffless tubes had development of significant biofilms as soon as 10 days and as long as 2 years after placement. Biofilms have been found on indwelling catheters elsewhere in the body as a source of chronic infection with the formation of resultant granulation tissue. This study demonstrates the presence and location of bacterial biofilms found on adult tracheostomy tubes at the time of routine tracheostomy tube changes.

SM70. Improving Reliability and Precision of Facial Grading for Multicenter Trials

John Gail Neely, MD, St. Louis, MO*
Cody B. Dickerson, Plattsburg, MO
Nevin G. Cherian, St. Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to grade facial paralysis sufficient for high level research efforts, suitable for multicenter trials comparing treatments and rehabilitative interventions.

Objectives: Reliable quantitative measures of outcome are fundamental for the successful performance of clinical trials; this is especially challenging in multicenter trials in which outcomes originate from a wide range of participating sites. A comparison was made between the widely used House-Brackmann scale (HB) and Sunnybrook Facial Grading System (SB). **Study Design:** Prospective. **Methods:** Thirty videotapes of subjects with a wide range of facial paralysis were randomly ordered before each assessment by two trained, but relatively naïve raters. Facial movements were graded independently using the HB and SB, twice for each scale. After those assessments were permanently recorded, the two raters were given a forced choice paradigm checklist with exact criteria for determining levels of movement for each domain and region found in the Sunnybrook system. **Results:** The results demonstrated inter-rater agreement using the HB was relatively poor (kappa 0.219 and 0.476). Inter-rater agreement using the SB was excellent (intraclass correlation coefficient absolute agreement 0.921 and 0.891; consistency 0.979 and 0.955). Inter-rater agreement using the forced choice criterion checklist generating a SB score was excellent and somewhat better (ICC absolute agreement 0.960 and 0.935; consistency 0.973 and 0.962). To demonstrate the relationship between the HB and SB, subjects were rank ordered by SB scores and the corresponding HB scores were overlaid in boxes showing the wide range of facial movements within each HB grade and the overlap between grades. **Conclusions:** These data support the Sunnybrook system is reliable and a criterion checklist enhances this reliability for use in multicenter trials involving facial paralysis.

SM71. Utilization of an Acrylic 3-D Model for Surgical Planning of a Skull Base Chondroblastoma

Samuel K. Pate, MD, Omaha, NE
Ryan K. Sewell, MD, Omaha, NE
Catherine A. Craig, MD, Omaha, NE
Gary F. Moore, MD, Omaha, NE*
Oleg N. Militsakh, MD, Omaha, NE

Educational Objective: At the conclusion of this presentation, the participants should be able to understand 1) the pathophysiology of chondroblastoma of the temporal bone/skull base; 2) the utilization of 3-D acrylic models for planning of surgical resection of skull base/temporal bone tumors; and 3) reconstruction of temporal bone defects using an iliac crest free flap.

Objectives: Present a case of chondroblastoma of the temporal bone presenting as a facial nerve paralysis and explain the use of a 3-D acrylic model in surgical resection planning. **Study Design:** This is a case presentation. **Methods:** Benign chondroblastomas of the temporal bone are extremely rare. They typically affect the long bones of younger patients. Approximately 1% affects the skull base, with about 63 cases reported in the literature. Most patients are older (average age 43.8 years) and present with otologic symptoms such as tinnitus, hearing loss, otalgia, vertigo and ear fullness. Temporal bone chondroblastomas tend to be more aggressive requiring more extensive resection. Recurrence rates for curettage are reported at 43% compared to 27% after wide resection with preservation of neurovascular structures. We report the first case reported in the literature of chondroblastoma of the temporal bone presenting with facial nerve paralysis. A 3-D acrylic model of the temporal bone and skull base was used preoperatively to plan the surgical approach for resection and also reconstruction of the skull base defect. The tumor was subsequently completely excised via a Fisch Type B infratemporal fossa approach. Reconstruction was achieved using an iliac crest free flap. At one year postoperatively, the patient is free of disease with full facial nerve function. **Results:** Successful resection and reconstruction of chondroblastoma of the temporal bone with the aid of a 3-D acrylic model. **Conclusions:** Chondroblastomas of the temporal bone are extremely rare. Surgical resection and reconstruction can be difficult. The use of 3-D models can be very beneficial when planning the surgical resection of temporal bone/skull base tumors.

SM72. Laser Myringoplasty for Tympanic Membrane Retraction Pockets Using a Flexible CO2 Laser Fiber

Thomas M. Pilkington, MD, Durham, NC
David M. Kaylie, MD, Durham, NC

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate the technique of laser myringoplasty for retraction pockets of the tympanic membrane using a novel flexible CO2 handheld fiber. The participants will explain the proposed mechanism of action of the procedure and discuss the results of the procedure. The participants will compare their technique to prior reported techniques and specifically discuss the advantage of a handheld CO2 laser system in this procedure.

Objectives: To describe and review our results treating tympanic membrane retraction pockets using laser myringoplasty with a novel handheld flexible photonic band gap fiber CO2 laser. **Study Design:** Retrospective review. **Methods:** A handheld flexible photonic band gap fiber CO2 laser system (Omniguide) was used to treat tympanic membrane retraction pockets by contraction with patients under general anesthesia in the operating room environment. A tympanostomy tube was placed if clinically indicated. **Results:** We have performed this procedure on four patients (five ears). We will report the results of the procedure including degree of hearing loss, necessity of tube placement and need for further procedures. **Conclusions:** Laser myringoplasty using a handheld flexible fiber CO2 laser appears to be a useful procedure in selected patients. The handheld laser allows the surgeon to control the amount of energy delivered to the tympanic membrane and allows the surgeon to work outside of direct line of sight of the microscope resulting in improved accuracy and precision of the procedure.

SM73. Current Practices in Microtia Repair

Michelle M. Roeser, MD, Rochester, MN
Oren Friedman, MD, Rochester, MN
Eric J. Moore, MN, Rochester, MN

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the various techniques for microtia repair and auricular reconstruction. The presentation will demonstrate the current use of these techniques as well as the outcomes and complications.

Objectives: To survey facial plastic and reconstructive surgeons to determine their current approaches to repair of microtia. **Study Design:** Survey. **Methods:** An extensive review of the literature was conducted. An electronic online survey was emailed to the members of the American Academy of Facial Plastic and Reconstructive Surgery. Completed surveys were reviewed and analyzed by a statistician. **Results:** Main outcome measures included age of initiation of repair, methods, number of stages, preferred framework materials, complications, and outcomes. **Conclusions:** In the almost 50 years since Tanzer described his methods of microtia repair, many variations have been reported and popularized. The information gained about current practices and outcomes will help guide surgeons in future patient care.

SM74. Case Control Analysis of Cochlear Implant Performance in the Elderly

Christina L. Runge-Samuels, PhD, Milwaukee, WI
Humera F. Baig, BS, Milwaukee, WI
Jamie W. Jensen, AuD, Milwaukee, WI
P. Ashley Wackym, 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) identify factors that predict performance in cochlear implant users; 2) describe differences in performance between elderly and younger adult cochlear implant users; and 3) identify improvement gains with cochlear implants in the elderly population.

Objectives: To characterize cochlear implant performance in the geriatric population as compared to younger implant users. **Study Design:** Case control retrospective analysis. **Methods:** Records for a total of 251 adult patients, including 81 patients with age at implantation (AAI) ≥ 65 years, were analyzed for ear specific preoperative speech perception performance, length of deafness, age at implantation, and 1-year postoperative speech perception performance. A subset of 28 elderly patients with complete data was matched to 28 younger adult patients (AAI 18-65 years) for preoperative performance using HINT/Q scores (average 22.4% and 23.0%, respectively). Postoperative performance between age groups was compared using ANOVA and regression analyses. **Results:** Of the total 56 matched subjects, 55 showed improvement in 1 year postoperative HINT/Q scores, with better preoperative performance predictive of better postoperative performance, independent of AAI ($p < 0.05$). Group comparisons, however, revealed poorer postoperative scores for the elderly subjects for HINT/Q (70.4% vs 83.2%; $p < 0.05$) and CNC (38.1% vs 52.8%; $p < 0.05$). Within the geriatric cohort, those implanted closer to 65 years of age tended to have better postoperative speech perception performance than those implanted in their 70s and 80s, particularly in noise ($p < 0.05$). **Conclusions:** Elderly patients benefit significantly from cochlear implantation. Compared to a younger cohort

matched for preoperative performance, however, their postoperative scores tend to be lower on some measures. Within the older population, age at implantation appears to become a significant factor with hearing in noise. These results inform guidelines for counseling the older patient regarding postoperative expectations.

SM75. Medical Malpractice and Hearing Loss

Ryan K. Sewell, MD JD, Omaha, NE

Gary F. Moore, MD, Omaha, NE*

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand medical malpractice as it pertains to hearing loss.

Objectives: To analyze the legal outcomes, patient populations, and clinical characteristics of medical malpractice litigation involving hearing loss. **Study Design:** Retrospective review of jury verdict reports from 1988-2007. **Methods:** 260 medical malpractice cases involving hearing loss sinonasal disease were obtained from a computerized legal database. **Results:** Defendants prevailed in 48% (124/260) of the cases. Plaintiffs received jury verdicts in 28% (73/260) with a mean award of \$1.1 million. The parties reached a settlement in 24% (63/260) with a mean award of \$740,000. The age could be determined in 203 cases, with a range of 0 to 87 years. Men and women were equally represented as plaintiffs. The level of hearing loss (total vs partial) could be determined in 204 cases, with 102 cases each of total and partial hearing loss. The defense outcomes were higher for partial loss versus total loss (55% vs 39%). Mean awards, however, were higher for total loss than for partial (\$1.5 million vs \$400,000). Perinatal events resulted in claimed hearing loss in 49 cases. Defendants prevailed in 29% (14/49), with an mean award of \$2.8 million. Hearing loss related to otologic surgery was claimed by 49 cases. Defendants prevailed in 53% (26/49), with a mean award of \$310,000. **Conclusions:** Medical malpractice related to hearing loss can be encountered by multiple specialties. As the hearing loss worsens, both the likelihood of an award and the amount increases. Future studies should focus on risk management strategies to reduce the exposure to medical malpractice related to hearing loss.

SM76. Use of Otobeam® CO2 Laser Fiber in Stapes Procedures

Taylor H. Shepard, MD, Durham, NC

David M. Kaylie, MD, Durham, NC

Christopher J. Danner, MD, Tampa, FL

Anand A. Deviah, MD, Boston, MA

Loren J. Bartels, MD, Tampa, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to use the Otobeam CO2 laser waveguide for stapes surgery.

Objectives: 1) To evaluate the utility of a novel carbon dioxide (CO2) laser delivery device in the performance of stapedotomy procedures; and 2) to define laser settings for stapes surgery using the CO2 laser. **Study Design:** Prospective study. **Methods:** Patients undergoing stapedotomies for the treatment of otosclerosis at a tertiary care center were included. The Omniguide Otobeam® CO2 laser fiber and Otobeam® hand piece was used in performing stapes surgery, including resecting the stapedial tendon, removal of the stapes superstructure, and performing the stapedotomy. Hearing results were analyzed using student t-test. IRB approval was obtained. **Results:** The laser fiber was used successfully in 25 cases. Surgeons found that it was adept at removing the stapes tendon, superstructure and in making the stapedotomy. The flexible fiber allowed for precise placement of the CO2 beam in anatomic locations that are difficult to reach without a fiber. In our series there were no cases of hearing loss, facial nerve injury or other complications. Hearing improvements are similar to published results using alternative surgical devices. **Conclusions:** The Omniguide Otobeam® handheld CO2 laser is the first device able to provide surgeons with the advantages of a CO2 laser delivered through a flexible fiber. This device can be a useful tool in performing stapes surgery due to its minimal thermal spread in the perilymph compared to the KTP laser. Future refinements of this technology such as smaller spot size and aiming beam will likely expand its appeal.

SM77. Coffin-Siris Syndrome and Neurofibromatosis Type 2: A Clinicopathologic Enigma

Denise R. Wong, MD, Minneapolis, MN

Janet S. Beneke, MD, St. Paul, MN

Seth C. Janus, MD, Minneapolis, MN

Samuel C. Levine, MD, Minneapolis, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the evaluation and management of a patient with Coffin-Siris syndrome and neurofibromatosis type 2.

Objectives: To describe a rare case of Coffin-Siris syndrome and neurofibromatosis type 2. **Study Design:** Case report. **Methods:** Retrospective case review at a university medical center. **Results:** A 27 year old man with a history of Coffin-Siris syndrome presented with a left tongue mass. The patient initially developed progressive evidence of neurological dysfunction below the level of T11. An MRI of the spine and CT myelogram were subsequently obtained showing several lesions in the T11-L3 regions. These paraspinal lesions were surgically explored and ultimately resected proving to be consistent with schwannomas. A presumed diagnosis of neurofibromatosis type 2 was therefore given. Additionally, an MRI of the head showed multiple intracranial schwannomas, evidence of bilateral chronic otomastoiditis, as well as an ovoid mass of the left tongue. Given his unusual clinical associations, the patient was referred to our center for further evaluation. A fine needle aspiration of the tongue mass was performed showing spindle cells with immunohistochemical stains favoring a tumor of neural origin. Since the patient's quality of life had not been significantly affected by the tongue mass, a conservative treatment approach was undertaken to monitor its progression until symptoms warrant surgical intervention. **Conclusions:** Coffin-Siris syndrome is a rare genetic disorder with just over 60 individuals diagnosed within a span of 30 years. A coexisting diagnosis of neurofibromatosis type 2 is an unusual occurrence, with no other known cases currently reported in the literature. Hence, the clinical presentation as well as the unique radiologic and pathologic correlations are discussed.

SM78. Osteolytic Lesions in the Craniofacial Skeleton of a Patient with Extrapulmonary Sarcoidosis

Richard J. Wright, MD, Baltimore, MD

Bryan T. Ambro, MD MS, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the nature of bony involvement in sarcoidosis in the head and neck, recognize the radiographic findings on computed tomography and the potential for these lesions to be confused with other disease, and understand the implications regarding disease treatment.

Objectives: To describe an uncommon presentation of sarcoidosis in the head and neck, and to review the current literature. **Study Design:** Case report and review of the literature. **Methods:** The patient's medical record, radiographic studies, and pathology were reviewed. A literature search was performed to identify reports of craniofacial osteolytic lesions associated with sarcoidosis. **Results:** The patient is a 52 year old woman with a history of pulmonary sarcoidosis who had been noncompliant with medical management. She presented to the otolaryngology clinic complaining of nasal obstruction, crusting, and epistaxis. On exam she had significant nasal crusting, friable mucosa with a nodular appearance, and cutaneous lesions consistent with sarcoidosis. A noncontrast maxillofacial CT was obtained that revealed osteolytic lesions in the premaxilla, the greater wing of the sphenoid, the parietal bone, and the C2 vertebra. In the operating room, biopsies were performed of the middle turbinate, a cutaneous lesion, and the premaxilla. All biopsies revealed noncaseating granuloma, consistent with sarcoidosis. The patient was referred to rheumatology and aggressive combination medical therapy was initiated. A literature review yielded 21 reported cases of intraosseous sarcoidosis in the maxilla and mandible, 3 cases involving the nasal bones, and 12 cases involving calvarial bones. **Conclusions:** Although the small bones of the hands and feet are frequent sites of intraosseous sarcoidosis, osteolytic lesions are rarely found in the craniofacial skeleton. Radiographically, these lesions can mimic other diseases, such as malignancy and infection. This case illustrates the importance of understanding head and neck involvement in sarcoidosis and of obtaining tissue diagnosis so that appropriate therapy may be initiated.

SM79. Parathyroidectomy in the Elderly Population: Does Age Really Matter?

Vyvy N. Young, MD, Louisville, KY

Muffin M. Fleming, MEd CCRP, Louisville, KY

Jeffrey M. Bumpous, MD, Louisville, KY*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) compare parathyroidectomy patients based on age; 2) understand specific outcome trends seen in older parathyroidectomy patients, including preoperative vs. postoperative calcium and PTH levels; 3) discuss the significance of persistently elevated postoperative PTH despite normocalcemia; and 4) describe the timing and types of complications seen in post-parathyroidectomy patients, especially those older than 65 years.

Objectives: Compare parathyroidectomy patients based on age: including demographics, outcomes, and complications. **Study Design:** Retrospective review. **Methods:** Review of parathyroidectomy database from 1998-2007. **Results:** 687 patients underwent parathyroidectomy, including 247 (36%) >65 years old. Discharge was more often on day of surgery in younger patients (42.5% vs. 29.2%, p=0.007) and >23 hours for older patients (24.7% vs. 12.3%, p<0.0001). Older patients stayed longer in the recovery room (134 vs. 107 minutes, p=0.005). There was no difference in history of prior neck surgery, extent of exploration, or intraoperative findings. Despite postoperative normocalcemia, older patients tended to have persistently elevated PTH (10.5% vs. 6.4%, p=0.07) whereas younger patients had normal PTH (81.6% vs. 70%, p=0.0007). PTH levels were low-abnormal (56-110) in younger patients (47% vs. 29%, p=0.046) but high-abnormal (>220) in older patients (16.6% vs. 9.55%, p=0.009). Overall complication rates were low (6-8%), with over 93% in either group having no major complications.

There was no difference in timing or types of complications, except that elderly patients were more likely to have cardiac complications (2.83% vs. 0.45%, $p=0.022$). **Conclusions:** Nearly 700 parathyroidectomies were performed at our institutions over 10 years. Elderly patients comprised one third of this population. They were likely to have longer hospital and recovery room stays, and postoperative normocalcemia with elevated PTH, which may actually be a normal finding for these patients. Older patients also had higher abnormal PTH levels. The rate, timing, and types of complications were similar between age groups, although elderly patients had more cardiac complications. When properly indicated, parathyroidectomy remains a safe and effective option for management of hyperparathyroidism in elderly patients.

Pediatrics/Sinus-Rhinology

SM80. Safety and Efficacy of the Endoscopic Modified Lothrop Procedure: A Metaanalysis

Peter C. Anderson, BA, St. Louis, MO

Raj H. Sindwani, MD FRCS, St. Louis, MO

Educational Objective: At the conclusion of this presentation the participants should be able to 1) understand the relevant anatomy and surgical technique of the endoscopic modified Lothrop procedure (EMLP; also known as the Draf III or frontal drill-out); and 2) discuss the current indications, potential complications, and expected outcomes of this surgery.

Objectives: The endoscopic modified Lothrop procedure (EMLP; also known as Draf III or frontal drillout) has recently gained popularity as a minimally invasive alternative to frontal sinus obliteration. This systematic analysis was designed to assess the safety and efficacy of the EMLP. **Study Design:** Literature review and metaanalysis. **Methods:** We performed a search of all English studies published from 1990 to 2008 that reported results from a minimum of five patients undergoing the EMLP. Of the 30 papers reviewed, 18 studies (evidence level II-2 or II-3) containing data from 612 patients met inclusion criteria. **Results:** The most common indications for EMLP were chronic frontal sinusitis (75.2%) and mucocele (21.3%). Patients had an average age of 47.9 years (range, 14 to 89 years) and were followed for 28.5 months postoperatively. Only 20.3% of procedures were performed without image guidance. Stents were rarely used (6%). The rate of major and minor complications was <1% and 4%, respectively. No deaths were reported. Majority of patients were discharged within 24 hours. Postoperative endoscopic findings, qualitatively reported in only 394 patients, demonstrated frontal sinus patency or partial stenosis in 95.9% at last followup. Where specifically assessed ($n=430$ patients), improvement in symptoms was achieved in 82.2% of cases, with 16% reporting no significant change, and 1.2% reporting worsening of symptoms. The overall failure rate (requiring further surgery) of EMLP was 13.9% (85/612). Eighty percent of failures underwent revision EMLP, while 20% elected osteoplastic frontal sinus obliteration. **Conclusions:** When performed by an experienced surgeon, EMLP is a safe and efficacious procedure which is well tolerated.

SM81. Effect of MPH® on Bleeding after Endoscopic Sinus Surgery: A Prospective Single-Blind Randomized Controlled Study

Justin L. Antisdel, MD, Saint Louis, MO

Jackie L. West-Denning, BA, Saint Louis, MO

Raj H. Sindwani, MD FRCS, Saint Louis, MO

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the effects of MPH® (Microporous Polysaccharide Hemispheres) treatment after endoscopic sinus surgery (ESS) as compared to no treatment; and 2) appreciate the advantages and disadvantages of using bioabsorbable hemostatic agents after ESS.

Objectives: Absorbable hemostatic agents are commonly used after sinus surgery. MPH® (Microporous Polysaccharide Hemispheres) is a novel hemostatic powder that is rapidly absorbed. The goal of this study was to examine the effects of MPH® on postoperative bleeding following ESS. **Study Design:** Prospective single-blind randomized controlled study. **Methods:** Patients undergoing bilateral ESS for CRS by the same surgeon were randomized to treatment with MPH® of only one side of the nose at the conclusion of surgery. The other side was untreated and served as a control. All patients received standard postoperative management. Patients completed symptom diaries using visual analogue scales (VAS, scored out of 100) at baseline and through postoperative day (POD) 30. Outcomes including bleeding, pain, obstruction, and nasal discharge were recorded separately for left and right sides. **Results:** Forty patients (19 men, 21 women) with an average age of 48.6 years were included. There were no complications and all patients were discharged home the same day. The mean bleeding score on POD 1 for MPH® treated sides was 22.2 versus 38.6 for untreated controls (mean reduction 16.5, $p<0.0001$, 95% CI -23.2 to -9.7). The scores for bleeding at baseline and at all other post-treatment days were not significantly different ($p>0.05$). There were no other significant differences between MPH® treated and control sides in any of the other variables measured during the study period. **Conclusions:** Application of MPH® significantly reduces bleeding in the immediate postoperative period following ESS. This is the first description of the use of this material in otolaryngologic surgery.

SM82. Hearing Loss in Children with Osteogenesis Imperfecta (OI) Treated with Bisphosphonates

Christi A. Arnerich, BS, Indianapolis, IN
Aaron C. Moberly, MD, Indianapolis, IN
Linda A. Dimeglio, MD, Indianapolis, IN
Richard T. Miyamoto, MD, Indianapolis, IN*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effect, or lack of effect, of bisphosphonate therapy on hearing loss.

Objectives: Bisphosphonate medications are established osteoporosis treatment and are used for therapy of OI, a collagen disorder causing fractures, blue sclerae, and hearing loss. Annual audiologic assessments in pediatric OI patients treated with bisphosphonates were done to determine therapy effects on hearing. **Study Design:** Annual audiologic assessments were performed to determine hearing loss. **Methods:** 28 children with OI types I (mild), or III/IV (moderate) underwent pure-tone audiometry with calculated pure-tone average (PTA), tympanometry, speech reception threshold (SRT), and acoustic reflex (AR) testing. Ages at first and last assessment were 2-17 years (y) (mean 8.3) and 4-18y (mean 11.1). 22 patients had multiple assessments. Hearing loss was defined as PTA at 500, 1000, and 2000 Hz >15 dB. **Results:** 6 patients, 5 type III/IV and 1 type I, had hearing loss. An 11 year old (y/o) increased PTA from 3 and 2 dB on right and left, respectively, to 7 and 25 dB over 4y. Bone conduction PTA of 15 on left at last assessment indicated sensorineural hearing loss. A 9y/o with PTA of 5 and 7 progressed to 23 and 25 over 4y and recovered to 18 and 12 over 2y. 3 children (ages 7, 7, and 3) showed progressive hearing loss over 1y, 1y, and 6y, respectively. A 4y/o had a single PTA of 17 and 13. **Conclusions:** 21.4% of children developed hearing loss, a percentage similar to previous population studies. Since all received treatment, we cannot determine directly bisphosphonate effects on hearing loss over time. However, it appears that bisphosphonates neither increase hearing loss, nor stop progression of hearing loss in these children.

SM83. Multiple Z-Plasty Approach to Congenital Midline Cervical Cleft

William Henry Barber, MD, Jackson, MS
J. Mark Reed, MD, Jackson, MS

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the clinical features of congenital midline cervical cleft and design an appropriate surgical approach for successful management.

Objectives: To highlight the clinical features of congenital midline cervical cleft and demonstrate the successful reconstruction with multiple Z-plasty. **Study Design:** Case report. **Methods:** A case review is presented of an 8 month old Caucasian female who was diagnosed with a congenital midline cervical cleft. A multiple Z-plasty reconstruction was performed with good cosmetic and functional results. **Results:** 10 month followup demonstrates good cosmetic and functional results with full cervical range of motion and no mandibular deformity. **Conclusions:** Congenital midline cervical cleft is an unusual developmental anomaly of the anterior neck. The etiology remains unclear, but is likely related to a failure of the branchial arches to fuse in the midline. The lesion presents at birth as a midline defect of the cervical skin occurring anywhere between the mandible and sternal notch. The diagnosis is clinical and can be associated with mandibular deformity, thyroglossal duct cyst, defects of the hyoid bone, cleft lip, or bronchogenic cysts. There is a female predilection. Surgical excision is advocated due to possible developmental mandibular deformity and reduced cervical range of motion. We present a case treated with multiple Z-plasty which resulted in a good cosmetic result and no limitation of cervical motion or mandibular deformity.

SM84. Endoscopic Transnasal Approach to the Clivus: A Radiographic Anatomical Study

Collin M. Burkart, MD, Cincinnati, OH
Lee A. Zimmer, MD PhD, Cincinnati, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the anatomic limitations of the endoscopic transnasal approach to the clivus.

Objectives: Operative intervention of anterior skull base lesions can be challenging. Various open and endoscopic surgical approaches have been described. The goal of the present study is to determine the anatomic limitations of the endoscopic transnasal approach to the clivus. **Study Design:** Anatomic study utilizing computed tomography. **Methods:** High resolution, surgical guidance CT images of the sinuses from 97 patients at a tertiary care medical center between 2002 and 2007 were evaluated. Axial and sagittal images were used to evaluate surgical access to the clivus. Multiple anatomical measurements were obtained and analyzed with imaging and statistical software. **Results:** Of the 97 imaging studies there were 39 males and 58 females. The width of exposure of the clivus without removal of the bony septum was 2.7 cm (1.9-3.4 cm) and with removal

of the bony septum was 3.6 cm (2.6-4.8 cm) ($p < 0.05$). No patients had complete exposure of the width of the clivus without septal removal compared to 56 (58%) patients with septal removal. The rostral-caudal distance of exposure inferior to the clivus is 1.4 cm (0.5-2.5 cm). Endoscopic exposure of the inferior limit of the clivus was adequate in all subjects. **Conclusions:** The endoscopic transnasal approach to the clivus is a viable option in the treatment of anterior skull base lesions with the preservation of functional anatomy in select patients. A significant portion of the population has a limited lateral extent of exposure with an endoscopic transnasal approach. Vertically, this approach allows complete access to the clivus in all patients studied.

SM85. Prediction of Postoperative Symptom Development of Idiopathic Intracranial Hypertension after Endoscopic Repair of Spontaneous Cerebrospinal Fluid Rhinorrhea

Elizabeth W. Chance, MD, Charlottesville, VA
John R. Gaughen, MD, Charlottesville, VA
C. D. Phillips, MD, Charlottesville, VA
Spencer C. Payne, MD, Charlottesville, VA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the rationale behind the supposition that idiopathic intracranial hypertension (IIH) may be the etiology of spontaneous cerebrospinal fluid rhinorrhea. Further the participants should be able to discuss the radiographic signs and symptoms of IIH.

Objectives: To determine if patients with spontaneous cerebrospinal fluid (CSF) rhinorrhea developed symptoms consistent with idiopathic intracranial hypertension (IIH) after surgical repair of and if this correlated with the presence of preoperative radiographic findings suggestive of IIH. **Study Design:** This is a retrospective analysis of patients at a tertiary care academic hospital coupled with a telephone survey of postoperative symptoms. **Methods:** Patients were identified retrospectively who underwent operative repair of CSF rhinorrhea from January 2000 through December 2007. Preoperative radiographic images were analyzed for the presence of signs associated with IIH. A telephone survey was then carried out to determine the prevalence of the postoperative development of symptoms associated with IIH. The data were analyzed and correlated through statistical analysis. **Results:** 14 patients were identified with an average age of 53.4 years and an average BMI of 34.7. A high percentage of patients demonstrated evidence of empty sella (60%), arachnoid pits (66.7%), or the presence of a meningo(encephalo)cele (66.7%). 2/14 patients developed both postoperative headache or tinnitus that was new, worse, or of a different character than preoperatively. No visual changes were noted. Four patients had recurrence of their rhinorrhea requiring additional operation(s). Analysis revealed no correlation between radiographic findings and the development of postoperative symptoms. While increased BMI was associated with the presence of a meningo(encephalo)cele ($p < 0.05$), there was no other predictor of radiographic finding or postoperative symptoms development. **Conclusions:** Patients with spontaneous CSF rhinorrhea commonly display findings consistent with IIH, however development of postoperative symptoms are rare and cannot be predicted by demographic or radiographic factors.

SM86. Significance of Ostiomeatal Complex Obstruction

Rakesh K. Chandra, MD, Chicago, IL
Aaron N. Pearlman, MD, Chicago, IL
David B. Conley, MD, Chicago, IL
Robert C. Kern, MD, Chicago, IL*
Dennis Chang, MD, Loma Linda, CA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the association between ostiomeatal complex obstruction and other phenotypic characteristics of chronic rhinosinusitis.

Objectives: Classic teaching has suggested that disease in the ostiomeatal complex (OMC) plays a pivotal role in the establishment of chronic rhinosinusitis (CRS). We sought to test this hypothesis. **Study Design:** Retrospective. **Methods:** Review of 106 consecutive patients enrolled prospectively into a tertiary allergy and sinus center database, meeting the task force definition of CRS. **Results:** Patients were stratified into 3 groups: bilateral OMC obstruction (BOMC, $n=38$), unilateral OMC obstruction (UOMC, $n=24$), no OMC obstruction (NOMC, $n=44$). The mean overall Lund-Mackay score for each of these groups was 3.6, 8.3, and 16.3 respectively ($p < 0.0001$). BOMC patients were significantly more likely to have asthma than those with UOMC or NOMC (52%, 17%, 16%, respectively; $p < 0.0001$). Nasal polyposis was also more frequently observed in the setting of BOMC (59%) compared to either UOMC (38%) or NOMC (13%) ($p < 0.0001$). Incidence of atopy was similar between groups. We then stratified the series by sides with OMC obstruction (wOMC, $n=112$) and those without OMC obstruction (sOMC, $n=100$). Modified Lund-Mackay score was calculated for the sinus cavities on each side, and this was significantly greater in the wOMC group (5.7 v. 2.0, $p < 0.0001$). The incidence of ipsilateral maxillary sinus disease was also significantly greater in wOMC sides ($p < 0.0001$). **Conclusions:** In the present series, >40% of patients meeting the task force definition of CRS did not manifest OMC obstruction radiologically. When present, OMC obstruction did correlate with presence of asthma and polyps. OMC

obstruction was also associated with increased disease burden overall and ipsilaterally.

SM87. Identification of Os Odontoideum and Congenital Fusion of C2 and C3 during Routine Tonsillectomy

Nidhi Gupta, MD, Milwaukee, WI

Valerie A. Flanary, MD, Milwaukee, WI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss congenital abnormalities of the cervical spine and proper workup of patients presenting with throat pain in the otolaryngology clinic.

Objectives: The objectives of this presentation are to discuss 1) the diagnostic workup of patients presenting with throat pain; 2) intraoperative examination of patients scheduled for routine tonsillectomy; and 3) congenital abnormalities of the cervical spine and risks associated with hyperextension during tonsillectomy. **Study Design:** Case report with review of the literature. **Methods:** Retrospective review, review of literature on cervical abnormalities, and risks associated with hyperextension of the neck during tonsillectomy. **Results:** During routine tonsillectomy in a 6 year old with a history of upper airway obstruction and throat pain, the oropharyngeal wall was palpated. A bony prominence was identified. The procedure was terminated and cervical spine films were obtained. The radiographs identified an os odontoideum and congenital fusion of C2 and C3. These findings are associated with cervical instability and often require neurosurgical intervention. Instability can lead to neurological injuries such as quadriplegia if left untreated and monitored. **Conclusions:** Congenital lesions of the cervical spine are uncommon. In patients presenting to the otolaryngology clinic for throat pain, diagnostic workup may include cervical spine x-rays. Examination of the oropharynx during tonsillectomy should always be performed.

SM88. Clival Fibrous Dysplasia: Case Series and Literature Review

Selena E. Heman-Ackah, MD MBA, Minneapolis, MN

Holly C. Boyer, MD, Minneapolis, MN

Rick M. Odland, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the presenting symptoms of patient with fibrous dysplasia of the clivus; and 2) review finding of magnetic resonance imaging characteristic of clival fibrous dysplasia.

Objectives: Twenty cases of fibrous dysplasia involving the clivus have been reported, primarily within the neurosurgical literature. This case series reviews the presentation of 4 patients with fibrous dysplasia of the clivus and reviews the literature regarding this topic. **Study Design:** Retrospective chart review and review of the literature. **Methods:** Four patients presenting to secondary and tertiary care centers within the same metropolitan area within the United States from January 1, 2006, to January 31, 2008, were reviewed. Presenting symptoms and radiological finding were reviewed. The English literature regarding fibrous dysplasia involving the clivus was reviewed. **Results:** There was a slight female preponderance for monostotic fibrous dysplasia involving the clivus. All patients within this series had a presenting complaint of headache or visual complaints. These findings are consistent with previous reports in the literature. Additional reported presenting findings include dysphagia, nontender occipital mass and asymptomatic incidental finding. MRI findings are characteristic of those associated with fibrous dysplasia in other sites of the body. **Conclusions:** There may be a slight female preponderance for clival involvement in monostotic fibrous dysplasia. Clival involvement in monostotic fibrous dysplasia may not be as rare as previously thought. Given the complexity, location and extent of involvement the management of this classically benign condition can pose a surgical challenge.

SM89. Universal Newborn Hearing Screening in the NICU: Who Do We Miss?

Stacey L. Ishman, MD, Baltimore, MD

Sara Rocheford, RN, Baltimore, MD

Tamekia L. Wakefield, MD, Kansas City, KS

David J. Brown, MD, Milwaukee, WI

David E. Tunkel, MD, Baltimore, MD*

Sandra Y. Lin, MD, Baltimore, MD

Educational Objective: At the conclusion of this presentation, the participants should be able to identify risk factors associated with failure to perform hearing screening in the neonatal intensive care unit.

Objectives: Knowledge of the developmental consequences of unidentified early hearing loss have prompted mandatory new-

born hearing screening. We sought to identify the incidence of infants discharged from the neonatal intensive care unit (NICU) without hearing screening and identify factors associated with failure to screen. **Study Design:** Retrospective case control study of all infants admitted to a tertiary care NICU in 2005 and 2006 who were discharged on day 3 of life or greater (N=914). **Methods:** Statistical analysis was performed using simple and multiple logistic regression. **Results:** A total of 605 of 914 (66.2%) infants underwent hearing screening prior to discharge. Gestational age of 26 to 30 weeks (OR 0.38, P<0.001), birth weight less than 2500g (OR 0.33, P<0.001) and discharge to an outside hospital (OR 0.44, P<0.001) were significantly associated with failure to screen. Screening was performed in 339 of 379 (89%) patients discharged to home, 207 of 256 (81%) patients transferred to another hospital unit, and 98 of 323 patients transferred to an outside hospital. The incidence of hearing screening increased with length of stay (P=0.002). Patients >50 days of age at discharge were more likely to undergo screening prior to discharge (OR=1.52, P<0.0001). **Conclusions:** Failure to perform hearing screening prior to discharge from the NICU was significantly greater for patients transferred to an outside hospital, low birthweight, gestational age <30 weeks and age <50 days at discharge. These data suggest that an increased emphasis needs to be placed on hearing screening of high risk infants in the NICU setting.

SM90. Ectopic Hamartomatous Cervical Thymoma Presenting as a Posterolateral Neck Mass in a Pediatric Patient

*Eric M. Jaryszak, MD PhD, Gainesville, FL
Carol J. Langdoc, MD, Gainesville, FL*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the embryology of the thymus gland and abnormalities resulting in cervical thymoma, understand the imaging and histopathology of this lesion, and discuss the pitfalls in diagnosis of this uncommon pathologic entity.

Objectives: To present an unusual case of ectopic cervical thymoma in a pediatric patient and review the literature on this rare tumor. **Study Design:** Case report and review of the literature. **Methods:** We present a case of a posterolateral ectopic cervical thymoma, the first such reported case, with review of imaging and pathology. We also review the English literature on ectopic cervical thymoma and discuss potential pitfalls in diagnosis and management. **Results:** Only approximately 30 cases of ectopic hamartomatous cervical thymoma have been described in the English literature. Of these, the majority are in the supraclavicular region with a single report involving the submandibular gland and another involving the sternocleidomastoid muscle. There were no reports of this tumor in the posterolateral neck. **Conclusions:** Ectopic cervical thymoma is an uncommon cause of a neck mass. It is important, however, to maintain this in the differential as there can be implications after removal in the perioperative period.

SM91. Digital Imagery Guided Somnoplasty of the Tongue Base

Yi H. Kao, MD, State College, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the digitally guided technique for radiofrequency volume reduction of the base of tongue (RFVR-BOT) and its efficacy in the treatment of obstructive sleep apnea (OSA).

Objectives: Present a simpler, safer method to deliver radiofrequency wave energy to the tongue base. **Study Design:** IRB approved prospective study adding RFVR-BOT to traditional surgery for OSA. **Methods:** RFVR-BOT was performed without the use of the mouth gag, leaving the tongue in its resting position, by guiding the somnoplasty handpiece with the index finger down to the vallecula anterior to the hyoid for placement of the electrodes into the genioglossus and geniohyoid muscles to create thermal lesions in the tongue base. Posterior placement avoids the lingual arteries and nerves and hypoglossal nerves, delivers energy to a thicker more vascular area of the tongue and may treat the geniohyoid to produce cicatrix formation and subsequent scar contracture to shorten the geniohyoid as well as shrink the tongue. Patients were treated with 10 to 16 RFVR lesions at each of one or two sessions, usually in conjunction with UPPP and/or nasal surgery. **Results:** According to the standard criteria for success or response of OSA to treatment (50% reduction of RDI and RDI <20 postop), 81 of 137 (59%) patients were successfully treated, 50 with one stage and 31 with two stages of surgery. There were no serious complications. **Conclusions:** Digital imagery guided RFVR-BOT is a simple, easy and effective way to treat the hypopharynx with minimal morbidity.

SM92. Bipolar Microdebrider Reduces Intraoperative Blood Loss and Operating Time during Nasal Polyp Surgery

*Nishant S. Kumar, BA, St. Louis, MO
Raj H. Sindwani, MD, St. Louis, MO*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the advantages

of using a microdebrider during endoscopic sinus surgery for chronic rhinosinusitis with nasal polyps; and 2) understand the potential additive benefits of using a microdebrider equipped with bipolar capabilities during surgery for nasal polyps.

Objectives: Bleeding during endoscopic sinus surgery (ESS) can interrupt the flow of the procedure and contribute to complications. Advances in microdebrider design now provide the ability to control bleeding with bipolar energy while suctioning and shaving polyps. We sought to examine the effects of this technology on blood loss and operating times during ESS for chronic rhinosinusitis with nasal polyps (CRS+P). **Study Design:** Retrospective case control. **Methods:** Eighty patients who underwent ESS for CRS+P by the same surgeon between January 2006 and May 2008, performed with either the PK Diego® (Gyrus ACMI-ENT Division, Bartlett, TN) bipolar microdebrider (PK group, n=40) vs. a standard microdebrider (n=40), were compared. Chart review examining demographics, comorbidities, and operative variables including blood loss, OR time, and complications was performed. Similar preoperative treatment and anesthesia protocols were used for all patients. **Results:** The groups were well matched (average age 43.1 years in both, 42.5% females vs. 47.5% in PK and control groups, respectively; $p>0.05$) and demonstrated similar disease burden on imaging (mean Harvard CT stage 3.12 for PK, 3.15 for controls; $p>0.05$). The PK group had significantly less intraoperative blood loss vs. controls (86.0 ml vs 123.0 ml respectively; $p=0.015$) and the use of this technology was associated with shorter OR time (88.9 min vs. 101.4 min for controls, $p=0.026$). There were no complications in either group. **Conclusions:** Utilizing a microdebrider with bipolar capabilities during ESS may offer the advantages of decreased blood loss and shorter operating times in patients with nasal polyps.

SM93. Pediatric Tonsillectomy: Coblation vs. PlasmaKnife

Michael J. Lipan, MD, Miami, FL
Christine T. Dinh, MD, Miami, FL
Ramzi T. Younis, MD, Miami, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to compare tonsillectomy outcomes between Coblation and PlasmaKnife techniques.

Objectives: Compare PlasmaKnife (dry) versus Coblation (wet) tonsillectomy in children in terms of 1) intraoperative effectiveness; and 2) postoperative clinical outcomes. **Study Design:** Retrospective randomized single blinded study. **Methods:** Medical records from children receiving dry versus wet tonsillectomy between May 14, 2007, and January 1, 2008, at a university affiliated tertiary care center were compared for operative time, blood loss, and postoperative complications. Statistical analysis used Fisher's exact test. **Results:** 164 patients were identified and 109 were included in the study. The most common reason for exclusion was inadequate followup. 57 patients underwent dry tonsillectomy (44% female, 56% male, average age: 6.3 years) and 52 patients underwent wet tonsillectomy (48% female, 52% male, average age: 6.7 years). The blood loss and duration of surgery were comparable between both techniques. Postoperative bleeding occurred in four dry (7.0%) and one wet tonsillectomy patient (1.9%) ($p<0.01$). **Conclusions:** In this pilot study comparing Coblation (wet) and PlasmaKnife (dry) tonsillectomy, results are comparable except for postoperative bleeding. The drawbacks of the study include small sample size, short period of followup, and a learning curve for use of PlasmaKnife versus years of experience with Coblation. These results warrant further investigation to better characterize potential benefits of PlasmaKnife tonsillectomy.

SM94. Congenital Thyroid Teratoma: Airway Management and Operative Outcome

Patrick D. Munson, MD, Rochester, MN
Laura J. Orvidas, MD, Rochester, MN*
Jan L. Kasperbauer, MD, Rochester, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the presentation of an infant with congenital cervical teratoma and discuss the appropriate airway and operative management.

Objectives: To highlight the uncommon presentation of congenital thyroid teratoma undetected by prenatal ultrasound; to review airway and operative management for congenital cervical teratomas. **Study Design:** A retrospective case review of a single patient with congenital teratoma of the left neck. **Methods:** The history, physical, imaging, operative, and followup findings of the patient are reviewed. Airway and operative management for congenital teratoma are discussed. **Results:** A 37 week gestation female was born by spontaneous vaginal delivery and found to have a large left neck mass. One minute Apgar score was 2 and the infant was intubated with a 2.5 ETT. 18 week prenatal ultrasound had not detected a neck mass. Preoperative CT and MRI revealed a 7 x 6 x 6 cm left neck mass consistent with congenital teratoma. Initial alpha fetoprotein level was 47,000 ng/ml. On day of life #5, the patient was taken to the OR for surgical removal. Direct laryngoscopy revealed moderate tracheal compression. The mass was completely excised, appearing to arise from the left thyroid lobe. Continuous left recurrent laryngeal nerve monitoring revealed absence of activity as it was thinned by the teratoma. Pathology was consistent with primary congenital thyroid teratoma. At 18 month followup the patient has persistent left vocal cord paralysis with no stridor or feeding difficulties. There is no evidence of recurrent teratoma and a normal alpha fetoprotein level. **Conclusions:** Congenital

teratomas of the neck are uncommon anomalies that require careful management of the airway to ensure survival. Operative technique can successfully remove the mass and relieve the airway obstruction.

SM95. Tracheal Compression Secondary to Esophageal Dilatation after a Slipped Nissen Fundoplication

Roy Rajan, MD, Memphis, TN

Jerome W. Thompson, MD MBA, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to evaluate stridor, understand signs and symptoms of tracheal stenosis, and understand how complications of a Nissen fundoplication can affect esophageal function.

Objectives: We describe a case report of a child presenting with tracheal compression from esophageal dilatation due to a slipped Nissen fundoplication. **Study Design:** Case report. **Methods:** A 20 month old female found to have extrinsic tracheal compression on bronchoscopy had a computed tomography scan reveal tracheal compression, esophageal dilatation and a paraesophageal hernia. An upper GI series confirmed the presence of a slipped Nissen fundoplication. The patient underwent a revision procedure to correct this. **Results:** Postoperatively, the patient's stridor subsided significantly as well as her neck retractions. She tolerated tube feeding without emesis and was discharged home. **Conclusions:** In a patient who presents with stridor and frequent emesis after a Nissen fundoplication, a slipped Nissen should be considered. Esophageal dilatation may have occurred causing tracheal compression. If this is found, revising the gastric wrap should alleviate the problem.

SM96. Methicillin Resistant Staphylococcus Aureus as a Cause of Neonatal Suppurative Parotitis

Grant T. Rohman, MD, Memphis, TN

John P. Selph, BS, Memphis, TN

Roy Rajan, MD, Memphis, TN

Jerome W. Thompson, MD MBA, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be familiar with the clinical presentation of neonatal suppurative parotitis, as well as explain the characteristics of the disease as described by the literature to date.

Objectives: To present two cases of neonatal suppurative parotitis, highlighting one case caused by methicillin resistant staphylococcus aureus (MRSA). This phenomenon has been described only once in the English language literature to date. **Study Design:** Case series with literature review. **Methods:** Two neonatal patients who presented with suppurative parotitis over a 6 month period were compared to the available descriptions of neonatal suppurative parotitis in the literature to date. **Results:** Two patients, both less than 30 days old, presented with suppurative parotitis. Both patients presented with fever and preauricular swelling. Despite treatment with broad spectrum antibiotics, both patients ended up requiring incision and drainage. This was accomplished through a postauricular approach, obviating any facial scars. One patient's culture grew methicillin resistant staphylococcus aureus (MRSA). Review of the literature revealed that staphylococcus aureus was indeed the most common pathogen implicated in neonatal suppurative parotitis, involving 63% of cases. However, this represents only the second case of MRSA neonatal parotitis in the English language literature. **Conclusions:** MRSA has become endemic in hospital acquired infections in the United States. As the prevalence of MRSA infections continues to increase, its susceptibility to various antibiotics, including vancomycin and clindamycin, is diminishing. As cases of MRSA neonatal suppurative parotitis begin to appear, this antibiotic resistance may become more problematic. Early surgical intervention may begin to play a more significant role to avoid potential complications and to hasten resolution of the disease process.

SM97. Tessier 7: A Case Report and Literature Review

Courtney B. Shires, MD, Memphis, TN

Rosemary R. Stocks, MD PhD, Memphis, TN

Mary M. Gorman, MD, Memphis, TN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the classification of facial clefts and be aware of the associated comorbidities of these clefts.

Objectives: With our presentation we aim to classify facial clefts, provide a case report of a child with Tessier 7, and document comorbidities of Tessier 7 clefts reported in the literature. **Study Design:** Case report and literature review. **Methods:** The medical record of a child with Tessier 7 was reviewed and a PubMed search of Tessier 7, facial clefts, comorbidities was performed. **Results:** We describe a patient with Tessier 7, severe GERD, and persistent hypercarbia requiring tracheostomy. This ignited our interest in the comorbidities that have been reported in association with Tessier 7. Among those found in a literature review are anophthalmia, preauricular skin tag, prominent ear deformity, type Ia hypoplastic mandibular ramus, absence of facial nerve

function in the distribution of the marginal mandibular nerve, oblique clefts of the soft palate, symmetric abnormal structure of the zygomatic arch, absence of medial or lateral pterygoid plates, and Treacher Collins syndrome. **Conclusions:** Our literature review located reports of many anomalies of the head and neck region but did not uncover any reports of respiratory illness in patients with Tessier 7.

SM98. Endoscopically Assisted Resection of a Recurrent Juvenile Nasopharyngeal Angiofibroma (JNA) with Contributions from the Internal Carotid Artery

John W. Werning, MD, Gainesville, FL

Brian L. Hoh, MD, Gainesville, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the unique management considerations associated with resection of a JNA that has an aberrant vascular supply.

Objectives: To describe the management considerations of aggressive JNAs with atypical vascular contributions. **Study Design:** Case report. **Methods:** This report describes a JNA that initially recurred following surgical resection and subsequently recurred after radiotherapy. Radiographically, the JNA extended from the pterygopalatine fossa into the nasopharynx. At the time of preoperative embolization, approximately 33% of its vascular supply was noted to arise from the internal carotid artery. The patient developed profuse epistaxis immediately following successful embolization of the external carotid supply to the JNA, which required tamponade via intranasal balloon placement until the time of surgery. An endoscopically assisted resection of the JNA was successfully achieved following open medial maxillectomy that removed the lateral nasal wall and provided optimal access to the nasopharynx and pterygopalatine fossa. Profuse hemorrhage from the region of the vidian canal was endoscopically controlled with monopolar cauterization. **Results:** The JNA was resected en bloc without complication. The estimated blood loss was 2100 cubic centimeters, and four units of packed red blood cells were transfused intraoperatively. The patient's postoperative course was uneventful. Subsequent magnetic resonance imaging surveillance documented the absence of recurrent disease. **Conclusions:** Preoperative identification of atypical vascular contributions to JNAs permits the surgeon to employ an operative technique that will maximize exposure for uneventful resection and control of hemorrhage.

SM99. Intrathecal Preoperative Contrast Enhanced Computed Tomography (CT) and Intraoperative Fluorescein Dye for Cerebrospinal Fluid (CSF) Leaks

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Educational Objective: At the conclusion of this presentation, the participants should be able to explain the complementary information provided by the use of preoperative intrathecal contrast enhanced CT scan and intraoperative intrathecal fluorescein dye injection for the localization of CSF leaks.

Objectives: To describe the utility of intrathecal contrast enhanced computed tomography in conjunction with intrathecal fluorescein dye injection for the preoperative localization and intraoperative control of CSF leaks. **Study Design:** Retrospective case series. **Methods:** Preoperative assessment with intrathecal contrast enhanced CT was used to predict the likely site of CSF leak. These sites were confirmed by the intraoperative identification of fluorescein containing CSF, and the skull base defect was repaired using established techniques. **Results:** In each patient, the site of CSF leakage corresponded to the region of primary concern on each of the contrast enhanced CT scans. In one patient, fluorescein permitted the visualization of a small encephalocele protruding through the posterosuperior roof of the sphenoid sinus where an abnormality had been correspondingly identified on contrast enhanced CT scan. **Conclusions:** Intrathecal fluorescein dye placement and intrathecal contrast enhanced CT scans provide complementary information that may be used for the localization and control of CSF leaks.
