

2008 MIDDLE SECTION PROGRAM

JANUARY 18-20, 2008
RENAISSANCE HOTEL, CHICAGO, IL

18th Friday January

4:00 - Speaker Ready Room - Bridgeport
8:00

5:00 - Registration - Grand Ballroom Foyer
8:00

6:00 - President's Welcome Reception - Grand Ballroom
7:30 pm Foyer

19th Saturday January

7:00 - Business Meeting (Members only) - Renaissance A-B
7:50 Breakfast with Exhibitors - Grand Ballroom 4-6

7:00 - Exhibit Hall Open - Grand Ballroom 4-6
4:00 View Posters

7:00 - Speaker Ready Room - Bridgeport
5:00

7:00 - Registration - Grand Ballroom Foyer
5:00

9:00 - Spouse Hospitality - Wacker
11:00

8:00 - Scientific Sessions - Grand Ballroom 1-3
4:15

8:00 Welcome and Introduction of President, Harold C. Pillsbury, MD*, Chapel Hill, NC
P. Ashley Wackym, MD*, Milwaukee, WI

8:05 Presidential Address
Workforce Issues in Otolaryngology-Head & Neck Surgery

* Denotes Fellow

Harold C. Pillsbury, MD*, Chapel Hill, NC

8:15 Introduction of Guests of Honor

Paul H. Ward, MD*, Pauma Valley, CA

Bruce J. Gantz, MD*, Iowa City, IA

Introduction of Vice Presidential Citations

Patrick E. Brookhouser, MD*, Omaha, NE

Sigsbee W. Duck, MD*, Gillette, WY

Maureen T. Hannley, PhD, Milwaukee, WI

Michael E. Glasscock, III, MD*, Austin, TX

Paul Popper, PhD, Whitefish Bay, WI

James B. Snow, Jr. MD*, West Grove, PA

Jeremy M. Wackym, MBA, Milwaukee, WI

8:45 Introduction of Keynote Speaker

Outcomes and Translational Research

Maureen T. Hannley, PhD, Milwaukee, WI

MODERATORS

Alan G. Micco, MD*, Chicago, IL

Cliff A. Megerian, MD*, Cleveland, OH

9:10 Spiral Ganglion Degeneration Patterns in Endolymphatic Hydrops

Paul J. Bixenstine, BA, Cleveland, OH

Cliff A. Megerian, MD, Cleveland, OH (Presenter)*

Mauricio P. Maniglia, MD, Cleveland, OH

Amit Vasanthi, PhD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the relationship between hydrops severity and spiral ganglion degeneration and correlate hearing loss patterns to cochlear histopathology.

Objectives: The mechanistic association between endolymphatic hydrops (ELH) and hearing loss is unclear. Although ELH severity has been shown to correlate with hearing loss, injury of vital structures including hair cells and the cochlear nerve fail to correlate with ELH severity. The goal of this study is to evaluate the hypothesis that spiral ganglion degeneration is the principle pathological site of ELH related cochlear injury and is most profound in the apical region. **Study Design:** Surgical induction of ELH in the guinea pig model followed by histological confirmation of ELH and correlation with segmental spiral ganglion densities. **Methods:** Guinea pigs (N=14) were subjected to unilateral ELH induction and sacrificed after 4 to 6 months. ELH severity and spiral ganglion densities were obtained using computer aided morphometric analysis. Densities were normalized by calculating a spiral ganglion degeneration index for each animal. **Results:** The apical spiral ganglion demonstrates significantly greater degeneration than the basilar spiral ganglion (index: 1.93 vs. 1.13; p = 0.004). The degree of spiral ganglion degeneration in the apex correlates well with a total hydrops index (THI) (p = 0.006) and an apical hydrops index (API) (p = 0.003) but not in the cochlear base (THI: p > 0.05; BHI: p > 0.05). **Conclusions:** ELH related pathology appears to focus on the apical spiral ganglion and the degree of deterioration correlates with the severity of ELH. These findings mirror some reports in the human condition and imply that the mechanism of cochlear dysfunction appears to be a neurotoxicity that begins in the apex of the cochlea.

9:18 Transcanal Antrotomy: A Minimally Invasive Surgical Technique

James J. Holt, MD, Marshfield, WI*

Educational Objective: At the conclusion of this presentation, the participants will understand a transcanal surgical technique used to expose the antrum.

Objectives: To show canal incisions, flaps, meatoplasty, instrumentation, and the surgical technique for transcanal antrotomy, including exteriorization of the antrum and cartilage occlusion of the mastoid. **Study Design:** Outcomes study related to an alternative surgical approach. **Methods:** A transcanal approach was used for disease in the antrum in 50 of the author's 3000 major otological surgeries. A wide, laterally based posterior canal flap is raised exposing conchal cartilage. A transcanal meatoplasty is performed. Transcanal drilling of posterior and superior canal bone creates a wide opening to the tegmen plate exte-

riorizing the antrum. For closure cartilage placed over the opening into the mastoid is covered with the posterior skin flap. **Results:** This transcanal exposure enabled removal of disease from the tympanum and antrum. Concurrent ossicular reconstruction in 26 cases produced an air bone gap closure within 20 dB in 23 ears (88%). All ears healed well without major complications and cochlear reserve was maintained. Skin graft to the canal was used in four cases. One patient required revision of the meatal area. Residual cholesteatoma was confined to the tympanum in 7 of 10 patients who had a planned second stage procedure. Ten patients have developed eardrum retraction or middle ear fluid. **Conclusions:** This transcanal technique is less invasive than an endaural approach or large postauricular incision and can be safely used when disease is confined to the tympanum and antrum.

9:26 Evaluation of Otologic and Neurotologic Procedures in Residency Trained Otolaryngologists Versus Fellowship Trained Otolologists/Neurotologists

Christopher R. Savage, MD, Cincinnati, OH
Robert W. Keith, PhD, Cincinnati, OH
Myles L. Pensak, MD, Cincinnati, OH*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the current training in otology and neurotology in otolaryngology residency versus otology/neurotology fellowship.

Objectives: The goal of this study was to determine the most common otologic and neurotologic procedures performed after completion of residency and to identify procedures which should be emphasized during the otolaryngology residency versus an otology/neurotology fellowship. **Study Design:** An internet survey of graduates from our department of otolaryngology-head and neck surgery residency program was undertaken. **Methods:** The survey was sent to 128 alumni trained within the last 25 years. General demographic data was obtained including years out of training, fellowship training, practice type, practice community size, surgical practice location, and best description of practice. Further questions were then asked pertaining to the types of otologic and neurotologic procedures performed and the number of cases performed over the past year. **Results:** Seventy of the 128 (54.7%) alumni responded. The majority performed the following: external ear incision and drainage (abscess/hematoma), excision of soft tissue external canal lesion, ventilation tube placement, tympanoplasty/ossiculoplasty, and mastoidectomy. Twenty-two (31.4%) performed stapedectomies/stapedotomies. A smaller number performed more complex procedures including excision of glomus tumors (15.9%), lateral temporal bone resection (12.9%), and implantation or revision of bone anchored hearing aids (11.4). Mostly fellowship trained neurotologists performed more advanced procedures including labyrinthectomy (7.14%), endolymphatic sac procedure (7.14%), cochlear implant (7.14%), facial nerve decompression (7.14%), acoustic neuroma surgery (5.71%), and vestibular nerve section (2.86%). **Conclusions:** Despite demographics supporting increased interest in fellowship training and subspecialty practice, most otolaryngologists continue to perform basic otologic procedures taught during residency. Complex cases, revision cases, and neurotologic procedures are more likely to be performed by fellowship trained otolaryngologists.

9:34 FIRST PRIZE - JOHN R. LINDSAY RESIDENT RESEARCH AWARD
Urocortin Expression in Mouse Cochlear Nucleus and Scarpa's Ganglion

James T. Brawner, MD, Oklahoma City, OK
Ann M. Thompson, PhD, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the innervation of the cochlear nucleus and Scarpa's ganglion by urocortin neurons.

Objectives: The cochlear nucleus is active in processing many different afferent and efferent inputs. There are many neuro-modulators that contribute to the diverse functions of the cochlear nucleus. Urocortin is a stress related peptide that is similar to corticotropin releasing factor and binds with high affinity to its receptors. It is found in several different brain centers and has been shown to be important in cochlear function via lateral olivocochlear neurons. The goal of the current study was to describe the distribution of urocortin fibers in the cochlear nucleus. **Study Design:** Prospective description of histological findings. **Methods:** Urocortin was labeled in brainstem sections collected from ten wild type mice by immunohistochemistry. Immunoreactive terminal fibers were digitally photographed as well as reconstructed in the cochlear nucleus under a drawing tube attached to a light microscope. **Results:** Urocortin immunoreactive fibers with en passant type varicosities were observed in the dorsal cochlear nucleus, cap region, posteroventral and anteroventral cochlear nuclei, various granule cell domains, and the cochlear nerve root. Most of the fibers were located in the granule cell domains and in the cochlear nerve root. Labeled axons were also observed exiting the lateral superior olive and traveling through the reticular formation to the vestibular nerve root in the olivocochlear bundle. The fibers were associated with varicosities in Scarpa's ganglion. **Conclusions:** The current findings indicate that lateral olivocochlear neurons expressing urocortin innervate both the cochlear nucleus and Scarpa's ganglion. These results are discussed in relation to vestibular function and tinnitus.

9:42 Q&A

**10:00 Break with Exhibitors - Grand Ballroom 4-6
View Posters**

MODERATORS

Rodney P. Lusk, MD*, Omaha, NE

Jay Piccirillo, MD*, St. Louis, MO

10:30 Prevention of Choking in Children: The Development of Standards

Scott M. Milkovich, PhD, Oak Brook, IL

James S. Reilly, MD, Wilmington, DE (Presenter)*

Luke B. Tao, MS, Oak Brook, IL

Daniel K. Stool, BA, Oak Brook, IL

Gene D. Rider, BA, Oak Brook, IL

Robert I. Altkorn, PhD, Oak Brook, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the historical development and limitations of national and international choking prevention standards.

Objectives: All child choking prevention standards are based on the small parts cylinder (SPC), a 31.5 mm inside diameter cylinder with a slanted bottom developed 35 years ago with limited clinical data. SPC effectiveness is evaluated in light of the fact that small parts remain among the most common causes of injury and fatality to preschool children. **Study Design:** We review the history of and medical basis for the SPC, evaluate its effectiveness based upon data from the past 30 years, and develop performance metrics for alternative standards. **Methods:** A literature review of American Academy of Pediatrics, USFDA, and CPSC studies is the basis for our analysis. The effectiveness of the SPC is studied through statistical analysis, and a new mathematical model is developed based on dimensions of objects in injury/fatality data. Implications of the under-three age limit are considered. **Results:** Twenty three percent of fatal and numerous nonfatal small part accidents over the past 20 years involved objects classified as safe by the SPC. The fraction of objects involved in injury passed by the SPC varies with diameter due to the slanted bottom, reaching over 90% for objects between 27.9 and 30.5 mm effective diameter. An alternate standard based on a 38.1 mm diameter open gauge for non-spherical objects and a similar 44.5 mm gauge for spherical objects could have prevented all small parts fatalities to children (including children three years of age and older) and the overwhelming majority of nonfatal injuries. **Conclusions:** Replacement of the SPC with a more conservative standard is recommended.

10:38 Nasal Airway Obstruction: Otolaryngology and Medical Allergy Perspectives

Nima L. Shemirani, MD, Milwaukee, WI

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

Asriani M. Chiu, MD, Milwaukee, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to compare attitudes in the evaluation and treatment of nasal airway obstruction between otolaryngologists and allergists.

Objectives: To discern current attitudes and practices of different medical specialties in the diagnostic and management strategies for patients with nasal airway obstruction (NAO). **Study Design:** A regional survey sent to allergists and otolaryngologists. **Methods:** A survey was sent to the practicing otolaryngologists and medical allergists in the regional area (N=268). Participants were asked to rank which test or procedure they most commonly perform to differentiate causes of NAO and also to rank the diagnostic tests they felt were most sensitive and specific (gold standard) for evaluating NAO. The second portion of the survey provided three distinct patient scenarios and participants were surveyed on their treatment plans. **Results:** Survey response rate was approximately 50% for both specialties. Nasal endoscopy was the most common first line diagnostic test for otolaryngologists versus allergists (58% versus 2%, $p<0.0001$), and allergy testing was most commonly used first by allergists (92% versus 0%, $p<0.0001$). Nasal endoscopy was considered the gold standard for evaluating NAO for 70% of otolaryngologists versus 29% of allergists ($p<0.001$), though nasal endoscopy was ranked in the top 3 for both specialties without statistical difference. Allergy testing was ranked among the top 3 choices for 75% of allergists versus 27% of otolaryngologists ($p<0.0001$). Patient scenario responses, however, demonstrated no significant differences between the specialties. **Conclusions:** Differences were demonstrated in the diagnostic workup preferences and perceptions of the gold standard for NAO between 2 medical specialties. Specialty bias, practitioner comfort level, and patient selection likely accounted for differences in responses. However patient management decisions, medical or surgical, appeared to be similar between the specialties.

10:46 Hemostatic Agent MPH® Does Not Affect Healing or Intact Sinus Mucosa

Justin L. Antisdell, MD, St. Louis, MO (Resident Travel Award)

Christine G. Janney, MD, St. Louis, MO

John P. Long, DVM, St. Louis, MO

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

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the effects of MPH® (microporous polysaccharide hemospheres) and FloSeal on both healing and intact paranasal sinus mucosa.

Objectives: Absorbable hemostatic agents are used routinely following sinus surgery. Recent studies have suggested that available biomaterials (e.g. FloSeal) may actually interfere with mucosal regeneration. This study was designed to evaluate the effects of MPH, a novel rapidly absorbing hemostatic powder, on healing and intact sinus mucosa. **Study Design:** Prospective controlled, using rabbit model. **Methods:** Maxillary sinuses of 14 New Zealand White rabbits were surgically opened and the mucosa of 10 was stripped bilaterally. The left antrum in 5 animals was treated with MPH and the other 5 received FloSeal. The maxillary sinuses of the remaining 4 rabbits were opened but the mucosa was left intact. MPH was applied to the left antrum in 2 animals and FloSeal in the other 2. The right sinuses served as controls in all 14 rabbits. Animals were sacrificed 2 weeks later and specimens were examined by a blinded pathologist. **Results:** Both healing and intact sinus mucosa exposed to MPH showed no significant changes when compared to respective controls. There was no identifiable MPH present in any of the specimens. In contrast FloSeal treated healing mucosa showed a histiocytic reaction with giant cells associated with non-resorbed material which was incorporated within regenerating tissues. Loss of surface epithelium with submucosal fibrosis and an eosinophil-rich mixed inflammatory infiltrate was noted. Unexpectedly this intense reaction was also observed in intact sinus mucosa exposed to FloSeal. **Conclusions:** Absorbable biomaterials have starkly different effects on mucosal healing. Unlike other agents MPH does not appear to have negative effects on healing or intact sinus mucosa.

10:54 Recurrent Acute Rhinosinusitis: Presentation and Outcomes of Sinus Surgery

David M. Poetker, MD, Milwaukee, WI

Jess C. Mace, MPH, Portland, OR

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

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss surgical outcomes of patients diagnosed with recurrent acute rhinosinusitis.

Objectives: The purpose of this study was to evaluate objective testing and patient based, prospectively collected data on patients diagnosed with recurrent acute rhinosinusitis (RARS) both before and after surgical intervention. **Study Design:** Prospective cohort with comparison group. **Methods:** Objective testing included scoring of preoperative computed tomography and pre- and postoperative endoscopic examinations. Patient based evaluation included the Chronic Sinusitis Survey and the Rhinosinusitis Disability Index completed pre- and postoperatively. A comparison group matched 1:1 included a patient cohort diagnosed with chronic rhinosinusitis without polyposis (CRS). **Results:** Twenty-two patients with the diagnosis of RARS were initially enrolled. Objective testing showed no significant difference between the cohorts for computed tomography, preoperative endoscopy, and postoperative endoscopy. Both cohorts showed statistically significant improvements in the total scores of both instruments postoperatively. Fewer RARS patients had undergone prior sinus surgery in comparison to CRS patients. CRS patients underwent significantly more extensive surgery than RARS patients. **Conclusions:** RARS patients have similar objective and patient based measures when compared to patients with CRS although scoring trends suggest worse quality of life and less objective evidence of disease in RARS at presentation. Patients with RARS also respond similarly well to surgery as patients with CRS, although generally require less extensive surgery and likely require less revision surgery.

11:02 Anatomy of the Anterior Ethmoid Artery for the Endoscopic Surgeon

April A. Camp, MD, Chicago, IL

Jay M. Dutton, MD, Chicago, IL

David D. Caldarelli, MD, Chicago, IL*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the endoscopic anatomy of the anterior ethmoid artery in order to aid in avoidance of the artery during endoscopic sinus surgery and for control of hemorrhage during endoscopic sinus surgery and epistaxis.

Objectives: Epistaxis commonly is self-limited or treated with conservative measures; however surgical intervention becomes necessary when these measures fail to control hemorrhage. Currently approaches to epistaxis vary and are carried out through different techniques, at times requiring an open procedure. The aim of this project was to provide support for an alternative, endoscopic control of the anterior ethmoid artery (AEA); that is, clip ligation of the artery in the periorbital space. Moreover precise knowledge of the anatomy of these arteries is needed to aid in avoidance of the arteries and control of hemorrhagic com-

plication during routine endoscopic sinus surgery (ESS). **Study Design:** Descriptive and feasibility cadaver study. **Methods:** Eight cadaveric specimens were obtained from the anatomy department. First endoscopic dissection of the AEA, with observation and description of anatomy, was performed on each of the sixteen distinct sides. Next clip ligation of each artery was performed endoscopically. Finally a careful assessment for dehiscences, cerebral spinal fluid (CSF) leak, and skull base penetration and disruption was performed. **Results:** The AEA was readily identified and successfully clipped in sixteen of sixteen specimens. No dehiscences, CSF leaks, or skull base defects were identified. Consistent and variant anatomy was observed and described. **Conclusions:** Endoscopic ligation of the AEA is a technically feasible method for the control of epistaxis. In addition this data is beneficial for routine ESS for avoidance of arterial injury and control of bleeding should this occur. Further research is needed for implementation of this new technique for in vivo control of epistaxis.

11:10 Q&A

11:20 PANEL: THE UNIFIED AIRWAY

Moderator: John H. Krouse, MD PhD*, Detroit, MI

Panelists: Todd A. Loehrl, MD, Milwaukee, WI
Stephanie Joe, MD, Chicago, IL
Robert J. Stachler, MD, Detroit, MI

12:15 Lunch - Renaissance A-C

12:15 - 1:45 Triological Thesis Seminar (non-credit) - Gold Coast

MODERATOR

Jan L. Kasperbauer, MD*, Rochester, MN

1:45 Tumor Volume as a Prognostic Factor in Oropharyngeal Squamous Cell Carcinoma Treated with Primary Radiotherapy

Mark J. Been, BS, Madison, WI

Joanna Watkins, MD, Madison, WI

Ryan M. Manz, MD, Madison, WI

Lindell R. Gentry, MD, Madison, WI

Glen E. Levenson, PhD, Madison, WI

Gregory K. Hartig, MD, Madison, WI

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role that factors such as tumor volume and T stage have upon the prognosis of patients with oropharyngeal squamous cell cancer.

Objectives: Tumor volume has been demonstrated to play a prognostic role in many head and neck cancers. The purpose of this study was to conduct an institutional review analyzing the correlation between tumor volume and local control of oropharyngeal squamous cell cancer treated with primary radiotherapy. **Study Design:** This study was a retrospective institutional chart review. **Methods:** 79 patients from 1991 to 2005 with primary T1-T4 oropharyngeal squamous cell carcinoma (base of tongue, n=31; soft palate, n=1; tonsils, n=47) were treated with primary radiotherapy. Tumor volumes were measured from pre-treatment computerized tomography (CT) scans by two observers. 3-D tumor volumes were calculated using a computer digitizer for each CT slice showing the primary lesion. Multivariate analysis was performed using tumor volume, TNM classification, tumor stage, location, and locoregional failure. **Results:** Tumor volume did not significantly correlate with locoregional failure (obs. 1, p=.6244; obs. 2, p=.5612). There was a high interobserver correlation (r=.98970). Multivariate analysis did, however, demonstrate a significant difference in locoregional failure between T4 tumors and all other T stages (T1 vs. T4, p=.0107; T2 vs. T4, p=.0004; T3 vs. T4, p=.0155). Nodal status, tumor stage, and location did not significantly correlate with locoregional failure rate. **Conclusions:** Tumor volume does not appear to play a significant role in predicting locoregional recurrence for patients with primary squamous cell cancer of the oropharynx treated with primary radiotherapy. However T4 status was predictive of poor regional control.

1:53 Treatment of Base of the Tongue Cancer with Induction Chemotherapy and Chemoradiation

Samuel B. Hancock, MSIV, Oklahoma City, OK (Presenter)

Greg A. Krempf, MD, Oklahoma City, OK

Carl R. Bogardus, MD, Oklahoma City, OK
Jesus E. Medina, MD*, Oklahoma City, OK

Educational Objective: At the conclusion of this presentation, the participants should be able to judge the effectiveness of a regimen of induction chemotherapy followed by concomitant chemoradiation in patients with stage III and IV cancers of the base of the tongue.

Objectives: To assess the effectiveness of induction chemotherapy plus concomitant chemoradiation in the treatment of advanced base of tongue cancer. **Study Design:** Prospective study of patients with advanced BOT cancer treated between 2001-2006. **Methods:** The study included 19 patients with BOT cancer, staged T2-T4, any N, M0 treated with a protocol of induction chemotherapy with TIP (Taxol, Iphosphamide, Platinum). If the primary tumor exhibited a complete response, patients were treated with radiation and weekly Taxol and Carboplatinum. The protocol called for surgery in cases that showed less than a CR or disease progression. Neck dissection was performed in cases with clinical or radiological evidence of persistent disease in neck nodes, 6—8 weeks after completion of treatment. **Results:** 17 patients were male and 2 female; the average age was 55 years (range 43-65). Sixteen patients had stage IV and 3 had stage III disease. TN stage distribution was as follows: T2:42%, T3:26%, T4:32%, N1:21%, N2:58%, N3:16%, NX:5%. Of the 19 patients initially enrolled 1 did not respond to induction chemotherapy, refused surgery and died of disease, followup information was not complete in 1 patient, 17 patients had a complete response to TIP and completed chemoradiation. All 17 patients had no evidence of local regional disease at a mean followup of 26.4 months. Only 1 of them developed distant metastases 30 months after completion of treatment. **Conclusions:** The treatment regimen studied is remarkably effective in stage II and IV BOT cancer.

2:01 Qualitative Risk Factors Differences May Explain Ethnicity Based Discrepancies in Mortality and Morbidity for Head and Neck Squamous Cell Carcinoma

Lori K. Howell, MD, Chicago, IL
H. Steven Sims, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to clearly understand the difference between race and culture and consider cultural factors as distinct from genetic predispositions toward disease states. We hope participants will begin to focus on risk factors as opposed to immutable factors, like race, when attempting to improve patient care.

Objectives: Much has been written regarding the discrepancy between African Americans and Caucasians diagnosed with head and neck squamous cell carcinoma (HNSCC). African Americans are documented to have higher incidence rates of HNSCC and disease specific mortality when compared to their Caucasian counterparts. Even with the comprehensive efforts made to implement uniform treatment and followup among head and neck cancer patients, there is still significantly poorer survival among African Americans when diagnosed with equivalent stage disease. Multiple studies have been put forth elucidating the statistics regarding incidence, stage at presentation, morbidity and disease free survival, but there is little in the literature regarding differences in specific risk factors between the two populations which may lead to these discrepancies. We seek to evaluate, in a qualitative manner, the specific social behaviors among these two separate populations in an effort to further explore the reasons behind the striking differences in outcomes when patients are diagnosed with HNSCC. **Study Design:** We designed a survey to look at specific risk factors for head and neck squamous cell carcinoma. We looked at dietary intake, educational level, third party payor status, and frequency of visits to a primary care provider. We also specifically inquired about the type of alcohol consumed and the type of cigarettes the patients smoked. **Methods:** Survey of patients at a tertiary care center. **Results:** Both Caucasians and African Americans presented more often with advanced stage HNSCC. A large percentage of African Americans versus Caucasians were not seeing a primary care physician at the time of diagnosis. Inexpensive fortified wine consumption was exclusive to the African American population. Patients who presented with advanced stage disease were more likely to be inexpensive fortified wine drinkers. A larger percentage of African Americans were smoking mentholated cigarettes. Among both races those smoking mentholated cigarettes were more likely to present with advanced stage disease. **Conclusions:** Much has been written about racial disparities in health care. It may be wise, however, to define the difference between race and cultural behavior patterns to more effectively reverse the widening gap.

2:09 Near Infrared Spectroscopy in the Monitoring of Microvascular Free Flaps in an Animal Model

Joseph M. McKenna, MD, Winnipeg, MB Canada (Resident Travel Award)
Arone Pabbies, MD FRCSC, Ottawa, ON Canada
Jeri Friesen, BSc, Winnipeg, MB Canada
Michael G. Sowa, PhD, Winnipeg, MB Canada
Thomas Hayakawa, MD FRCSC, Winnipeg, MB Canada
Paul D. Kerr, MD FRCSC, Winnipeg, MB Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to compare various methods for monitoring microvascular free flaps and discuss the limitations of various methods.

Objectives: To utilize near infrared spectroscopy (NIRS) as a noninvasive method to monitor the viability of free flaps and to compare NIRS to the implantable venous Doppler. **Study Design:** Prospective, randomized series using an animal model. **Methods:** NIRS was used to measure variables which correlate with tissue perfusion and oxygenation. An epigastric artery island flap was raised in 20 rats. Vascular insults were simulated by clamping vessels to the flap. Measurements were taken using NIRS at the time of clamping and at 15-, 30-, 45-, and 60 minutes of occlusion. Clamps were removed and final NIRS measurements were taken. In the second experiment a flap was raised in 6 rats each of which underwent a series of short-lived occlusions. The occlusions were monitored with both NIRS and the implantable venous Doppler. **Results:** In the first experiment disruptions in flap perfusion resulted in significant changes in tissue hemoglobin oxygen saturation and total hemoglobin concentration as detected using NIRS. NIRS predicted vascular compromise with a sensitivity of 98.7% and a specificity of 100%. In the second experiment NIRS predicted vascular compromise with a sensitivity and specificity comparable to that of implantable Doppler as interpreted by two experienced microvascular surgeons. NIRS had the added benefit of differentiating between arterial and venous occlusion. **Conclusions:** NIRS represents a reliable method of noninvasively monitoring free flaps. Further investigations as to the clinical utility of NIRS as an adjunctive monitoring device are currently being performed.

2:17 Matrix Metalloproteinase 9 (MMP 9) as a Factor in Oral Cancer Progression

Laurie A. Hohberger, MD, Minneapolis, MN
Beverly R. Wuertz, BA, Minneapolis, MN
Frank G. Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand that local cytokine networks may contribute to the progression of oral cancer.

Objectives: It is well known that invasion is a seminal event in the progression of head and neck carcinoma. We have previously demonstrated that TNF and its dependent cytokines are upregulated during oral carcinogenesis in saliva. TNF dependent events stimulate NF kappa B and many NF kappa B dependent genes are associated with cancer progression. In the present study we examined NF kappa B stimulation of MMP 9 in a precancerous keratinocyte cell line that models leukoplakia. **Study Design:** Preclinical molecular study in cell lines. **Methods:** We stimulated RHEK keratinocytes with both TNF, LPS, and PMA, known stimulants of NF kappa B. We examined the cells for changes in MMP 9 by luciferase reporter gene assay, a functional assay of MMP-9 activation, and RT PCR MMP-9. **Results:** We discovered that the MMP-9 promoter was significantly stimulated by PMA and TNF on luciferase reporter genes. Further we uncovered that functional activation of the MMP-9 promoter was accompanied by significant increases in MMP-9 gene expression as judged by RTPCR. Functional activation of the protein was stimulated by TNF and PMA on a fluorescence assay. Finally we searched our salivary proteomic database for increases in MMP-9 and discovered that it was the third most significant protein in salivas or oral cavity cancer patients over normal controls. **Conclusions:** We conclude that the milieu cytokine TNF has the capacity to provide stimulation of events related to early invasion of oral cavity cancer as judged by modulation of MMP-9.

2:25 SECOND PRIZE - DEAN M. LIERLE RESIDENT RESEARCH AWARD Effectiveness of Sonographically Localized and Directed Compartmental Neck Dissection for Recurrent Differentiated Thyroid Carcinoma

Lisa Lee, MD, Cincinnati, OH
David L. Steward, MD, Cincinnati, OH*

Educational Objective: At the conclusion of the presentation, the participants should be able to explain how ultrasound serves as an effective tool to detect and guide surgical management of recurrent thyroid carcinoma. Participants would also be able to compare the use of sonographic lymph node surveillance with thyroid specific biochemical markers as indicators of recurrent or residual disease. Additionally participants would be able to discuss the clinical implications of sonographically detected nodal disease, biochemically positive markers, and palpable nodal disease in determining the indications for compartmental neck dissection.

Objectives: Determine the effectiveness of sonographically directed compartmental neck dissection for recurrent differentiated thyroid carcinoma as confirmed by ultrasound surveillance of nodal status and thyroid specific biochemical markers. **Study Design:** Retrospective chart review. Comparison of cohort patients (underwent lymph node dissection) and control patients (declined surgery). **Methods:** Retrospective cohort study of 18 patients with sonographically localized and pathology confirmed recurrent differentiated thyroid carcinoma. Fifteen patients chose to undergo compartmental neck dissection by a single surgeon. Surgery involved functional neck dissection including lateral (levels II-V) and/or central (level VI) compartments. Three patients declined surgery despite proven recurrent lymph node disease. **Results:** All eighteen patients started out with sonographic evidence of recurrent lymph node disease. Preoperative thyroglobulin or thyroglobulin antibody levels were detectable in 15 out of 18 patients (83%). Postoperatively all fifteen patients who underwent compartmental lymph node dissection had no

sonographic evidence of lymph node disease. Of these fifteen patients postoperative thyroglobulin or thyroglobulin antibody levels were undetectable in 13 out of 15 patients (87%). Furthermore three out of 4 patients (75%) converted to thyroglobulin antibody negative status after surgery. All three patients who declined surgery had persistently detectable sonographic nodal disease in addition to positive thyroglobulin and/or thyroglobulin antibody levels (100%). Surgical complications were minimal and self-limited as no patient experienced permanent cranial nerve deficits. **Conclusions:** Ultrasound directed cranial nerve sparing compartmental lymph node dissection results in no sonographically detectable cervical lymph node disease and undetectable basal thyroglobulin or thyroglobulin antibody levels in the majority of patients with low morbidity.

2:33 Q&A

2:40 Break with Exhibitors - Grand Ballroom 4-6

3:10 PANEL: CONTEMPORARY MANAGEMENT OF FACIAL PARALYSIS
Moderator: John S. Rhee, MD MPH*, Milwaukee, WI
Panelists: David B. Hom, MD FACS*, Cincinnati, OH
Oren Friedman, MD, Rochester, MN
Sang H. Hong, MD, Milwaukee, WI

4:15 Announcements and Adjournment

5:00 - Meet the Authors Poster Reception - Grand
6:30 Ballroom 4-6

20th Sunday **January**

7:15 - Business Meeting (Members Only) - Renaissance A-B
8:05 Breakfast with Exhibitors - Grand Ballroom 4-6

7:00 - Exhibit Hall Open - Grand Ballroom 4-6
11:00 View Posters

7:00 - Speaker Ready Room - Bridgeport
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9:00 - Spouse Hospitality - Wacker
11:00

8:00 - Scientific Sessions - Grand Ballroom 1-3
11:00

8:10 Announcements
Introduction of Poster Award Winners
Introduction of Resident Research Award Winners
James T. Brawner, MD, Oklahoma City, OK
Lisa Lee, MD, Cincinnati, OH
Laura H. Swibel Rosenthal, MD, Detroit, MI
Introduction of George L. Adams, MD Young Faculty Award Recipients

Daniel I. Choo, MD, Cincinnati, OH
Sam J. Marzo, MD, Maywood, IL

MODERATOR

Michael S. Benninger, MD*, Detroit, MI

8:30 Role of Neurotrophic Factors in Muscle Stem Cell Survival: Implications for Treatment of Laryngeal Denervation Injuries

Kelly K. Hiatt, MD PhD, Indianapolis, IN
Moumita L. Naidu, BS, Indianapolis, IN
Stacey L. Halum, MD, Indianapolis, IN
D. Wade Clapp, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to appreciate that neurotrophic factors enhance MSC survival and the biochemical pathways that mediate these processes.

Objectives: To elucidate which neurotrophic factors may enhance MSC survival and identify novel biochemical pathways that mediate cell survival in MSCs. **Study Design:** We assessed MSC survival response to several neurotrophic factors including vascular endothelial growth factor (VEGF), ciliary derived neurotrophic factor (CNTF), insulin-like growth factor-1 (IGF-1), and neurturin (NTN) in a well characterized in vitro assay. Additionally activation of several cell signaling pathways was evaluated in response to these factors via western analysis. **Methods:** As above. **Results:** While all factors enhanced MSC survival, CNTF had the greatest positive influence. Furthermore CNTF mediated survival was shown to be mediated by the phosphatidylinositol 3-kinase (PI-3K)- Akt pathway as CNTF mediated survival was abrogated by an inhibitor of PI-3K, LY294002. Finally these findings were supported using a genetic model employing MSCs derived from mice deficient in class I_A PI-3K (p85 α ^{-/-} mice). Here the survival benefit imparted by CNTF was completely abrogated in PI-3K deficient MSCs compared to wild type MSCs. **Conclusions:** These studies identify CNTF as an important mediator of MSC survival. Furthermore the PI-3K-Akt pathway was demonstrated to be the mechanism by which CNTF mediates MSC survival. Such findings support a model involving MSCs genetically engineered to secrete CNTF for the treatment of laryngeal denervation injuries, whereby promotion of neural regeneration coexists with autocrine mediated enhancement of MSC survival.

8:38 PTK-6 Expression in Recurrent Respiratory Papillomatosis: The Apoptotic Pathway as a Therapeutic Venue

H. Steven Sims, MD, Chicago, IL
Naveen D. Bhandarkar, MD, Chicago, IL (Presenter)
Odile David, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand cellular apoptosis and how HPV allows cells to evade this surveillance mechanism.

Objectives: The molecular mechanisms of aggressive growth of lesions in recurrent respiratory papillomatosis (RRP) are not well characterized. PTK6 (BRK) is a non-receptor tyrosine kinase which has been previously demonstrated to localize in the nucleus and cytoplasm of normal epithelial cells of normal differentiated oral squamous epithelium, with weaker expression and change in localization when compared to oral squamous cell carcinoma. The current study objective is to determine staining pattern in RRP and compare it to previously studied patterns of expression. **Study Design:** Surgical specimen blocks collected during prior operations were selected for immunohistochemical staining. **Methods:** Antibodies for Survivin and PTK-6 were used to study expression of these proteins using Western blot analysis. **Results:** Papilloma specimens stained positive for PTK6 in both nucleus and cytoplasmic fractions similar to normal differentiated epithelium. We confirmed the presence of PTK-6 in papilloma cells. **Conclusions:** PTK6 was expressed in human papilloma virus infected cells. Protein expression may correlate with the cells' ability to escape cellular apoptosis.

8:46 Characterization of Laryngeal and Skeletal Myoblast Survival and Proliferation

Patrick C. Walz, BS, Indianapolis, IN
Moumita L. Naidu, BS, Indianapolis, IN
Kelly K. Hiatt, MD PhD, Indianapolis, IN
Stacey L. Halum, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the differences in proliferation and survival of laryngeal and skeletal myoblasts and comprehend how these differences relate to the distinctive

responses of these tissue types to injury.

Objectives: Numerous previous authors have noted differences between laryngeal muscle and skeletal muscle. These differences include differential myoblast response following denervation, myoblast activity levels in uninjured tissue, and concentration of myoblasts. Given these differences it is the purpose of this investigation to characterize the in vitro proliferation and survival of laryngeal and skeletal myoblasts to determine whether intrinsic differences exist that may account for differences noted in vivo. **Study Design:** Basic science experiment utilizing rat myoblasts. **Methods:** Cultures of both laryngeal and skeletal myoblasts were harvested and equal numbers of myoblasts from both groups were expanded under similar conditions, quantifying cellular population at each passaging to establish proliferation of each population. As per standard survival assay, protocol cultures were placed in serum deprived medium and cell survival in the nutrient deprived medium was assessed by trypan blue exclusion following 48 hour incubation. **Results:** Our results demonstrate differences in the proliferation and survival of laryngeal and skeletal myoblasts when cultured under similar conditions. Such differences are reflective of the physiologic demands and responses involved in each cell population's tissue of origin. **Conclusions:** These data suggest that the increased plasticity and resiliency of laryngeal myoblasts contributes to the differing responses of these tissues to injury.

8:54 Dysplasia in Adults with Recurrent Respiratory Papilloma: Incidence and Risk Factors

Ethan Handler, BS, Milwaukee, WI

Joel H. Blumin, MD, Milwaukee, WI

C. Blake Simpson, MD, San Antonio, TX*

Albert L. Merati, MD, Milwaukee, WI*

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the risk factors and clinical issues related to recurrent respiratory papilloma associated dysplasia.

Objectives: Recurrent respiratory papilloma (RRP) continues to be a major source of morbidity in laryngology. The incidence of dysplasia in specimens from adult patients has not been well described. In this study risk factors and incidence of RRP associated dysplasia are investigated. **Study Design:** IRB approved retrospective chart review. **Methods:** Pathology specimens from all patients undergoing surgical treatment for RRP over a six year period are identified and reviewed along with the patients' clinical and demographic information. **Results:** Thirty male and 11 female patients (total n = 41, mean age 51.6 years) were treated during the study period. 104 RRP specimens are identified; some degree of dysplasia was identified in 13/104 (12%) specimens. Nine of the 41 patients were found to have dysplasia (21.9%) at some point during their clinical course. Though the RRP associated dysplasia patients were older (56.7 vs. 50.6 years of age), this difference did not reach statistical significance ($p < 0.37$, unpaired t-test). There was a male preponderance in both dysplastic (7/9, 77%) and non-dysplastic (23/32, 72%) cases. Over the course of the study period the mean number of operations for RRP was 2.8 for each group, again with no significant difference between the dysplastic and non-dysplastic cases. Four of the 9 dysplasia patients (44%) and 14/30(46%) non-dysplasia patients had a history of tobacco use ($p < 0.29$, chi-squared). **Conclusions:** Dysplasia was discovered in over 20% of adult RRP patients studied over a 6 year period. Age, sex, tobacco history, and operative frequency were not identifiable risk factors for the presence of dysplasia.

9:02 System Changes Improve Access to Head and Neck Oncology Nutrition Clinic

Carol M. Bier-Laning, MD, Maywood, IL

Laura K. Romstedt, BS, Hines, IL

Siobhan M. Martin, BS RD, Hines, IL

Micah Horvitz, BS RD, Hines, IL

Sharon Foley, MS RD, Hines, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the benefit of nutritional management in head and neck cancer patients, understand ways to identify head and neck patients at risk for nutritional problems, and identify ways to improve the number of at risk head and neck cancer patients seen by a dietitian.

Objectives: Patients who present with head and neck carcinoma are often malnourished and this can worsen with treatment. Our group and others have seen a positive effect on nutritional parameters, mucositis and quality of life with nutritional counseling. However our perception was that a large percentage of patients at risk for nutrition related problems were not being referred to our head and neck nutrition clinic (HNNC). The objective of this study was to identify problems in the current system of HNNC referrals using the Total Quality Management technique and to focus interventions on these problems that will lead to improved numbers of appropriate HNNC referrals. **Study Design:** Nontraditional, quasi-experimental design which uses a process improvement method in order to systematically implement changes with pre- and post-implementation measures. **Methods:** A flowchart of the process by which patients were referred to the HNNC was created and system problems were identified. Strategies for improving each problem were implemented. Results were analyzed by comparing the number

of at risk patients referred to the dietitian pre- and post-implementation of changes. **Results:** As a result of studying the process by which patients were identified at nutritional risk and counseled by the dietitian, several changes were implemented. The percentage of patients considered at risk who were referred to the HNNC increased from 6/31 (19%) to 34/47 (72%) after changes were implemented. **Conclusions:** The process of referring patients to the HNNC was successfully changed using the Total Quality Management technique leading to a greater percentage of referrals for patients at nutritional risk. Optimizing this process will allow us to effectively capture patients for future clinical studies and routine nutritional management.

9:10 Muscle Stem Cell Culture Derivation after Prolonged Tissue Incubation: Implications for Therapeutic Applications

Ahmed S. Sufyan, BS, Indianapolis, IN
Kelly K. Hiatt, MD PhD, Indianapolis, IN
Moumita L. Naidu, BS, Indianapolis, IN
Stacey L. Halum, MD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the technical challenges involved in translating muscle stem cell experiments into future otolaryngologic clinical applications.

Objectives: Future otolaryngologic clinical applications for autologous muscle stem cells (MSCs) include reconstruction of glossectomy or partial laryngectomy defects and the treatment of vocal fold paralysis. Despite the potential therapeutic benefits current literature suggests a muscle biopsy needs immediate processing for successful autologous MSC culture, implying that autologous MSC therapy could not be offered at medical centers without cell culture facilities. The aim of this project was to determine if MSCs could be derived from muscle biopsies after a prolonged incubation period (mimicking overnight transportation time), suggesting autologous MSC therapy could be widely offered. **Study Design:** Basic science experiment examining three conditions: -80°C with no additives, room temperature in culture medium (CM), and 4°C in CM. **Methods:** Approximately one gram of rat skeletal muscle was collected and placed into three different conditions for 24 hours. Outcomes included MSC proliferation rates and the time interval required to reach therapeutic quantities of MSCs (107 cells). Apoptosis assay was also performed to establish cell viability in the incubated muscle specimens. **Results:** Interestingly therapeutic quantities were obtained after incubation of tissue specimens in the culture medium at 4°C and room temperature while no viable MSCs were derived from muscle after the -80°C incubation. The apoptosis assays were explanatory of cell culture findings. **Conclusions:** This study demonstrates that viable MSCs can be derived from muscle biopsies after a 24 hour incubation period. Moreover findings suggest tissue could be transported with simple, cost-effective methods, allowing autologous MSC therapy to be offered even at institutions without cell culture capability.

9:18 Q&A

9:28 Break with Exhibitors - Grand Ballroom 4-6

10:00 PANEL: SUDDEN HEARING LOSS: WHAT NOW?

Moderator: Alan G. Micco, MD* Chicago, IL

Panelists: Cliff A. Megerian, MD*, Cleveland, OH

Myles L. Pensak, MD*, Cincinnati, OH

David R. Friedland, MD PhD*, Milwaukee, WI

11:00 Introduction of Vice President-Elect, Lauren D. Holinger, MD*, Chicago, IL

P. Ashley Wackym, MD*, Milwaukee, WI

11:05 Adjourn

2008 MIDDLE SECTION POSTER PROGRAM

M1. Otologic Trauma Following Airbag Deployment

Nadir Ahmad, MD, Nashville, TN

Kathleen Yaremchuk, MD, Detroit, MI (Presenter)*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the basic mechanics of airbags, the impact that airbag deployment has on the auditory system, and to discuss the various symptoms and signs related to otologic trauma following airbag deployment.

Objectives: Supplemental restraint systems include vehicular airbags and were first available as an optional passive restraint system in 1973. The National Highway Traffic Safety Administration (NHTSA) mandated that all 1998 vehicles be equipped with both driver and passenger side airbags. There have been many anecdotal reports of otologic trauma sustained from airbag deployment as well as resulting lawsuits against various vehicle companies. Acoustic trauma remains a poorly understood and recognized sequela of airbag deployment. The purpose of this study is to determine, prospectively, the incidence of otologic trauma following airbag deployment and to describe the physiologic aspect of airbag impulse noise and its effects on the auditory system. **Study Design:** A prospective observational, IRB approved study. **Methods:** Subjects were identified in the emergency room and enrolled if they met the following inclusion criteria: they were involved in an MVA with airbag deployment and were ambulatory and able to undergo otologic and audiologic assessment within 24 hours of the accident. Audiologic assessment included immittance, pure tone audiogram, speech audiometry and DPOAEs. The subjects were then reevaluated for comparison every 6 weeks with repeat otologic and audiologic testing or until the resolution of the hearing loss or other otologic trauma. Hearing loss on audiogram was defined as thresholds of 15dB or greater at any frequency, asymmetry of greater than 10dB at any frequency, or a subjective complaint of hearing loss. **Results:** Twenty-three subjects (11 males, 12 females) were enrolled in the study. Characteristics of these subjects included an age range of 13-80 years and a mean age of 24.9 years for males and 40.4 years for females. The mean speed of the vehicle at time of accident was 33.2 miles per hour (mph). There were 17 drivers and 6 front seat passengers. A total of 10 out of 23 (43.5%) subjects had hearing loss at the time of the first audiogram including 6/17 (35.3%) of drivers and 4/6 (66.7%) of passengers. In terms of head position at the time of deployment 18 subjects had their head forward and 5 had their head turned to the left. Hearing loss was sustained in 7/18 (38.9%) of subjects with their head forward and 3/5 (60%) of subjects with their head turned to the left. Out of the 23 subjects 6 had their windows open at the time of deployment and 4/6 (66.7%) sustained hearing loss at the first audiogram. Conversely 17 subjects had their windows closed at the time of deployment and only 6/17 (35.3%) sustained hearing loss. Side airbags were deployed in 19/23 subjects and hearing loss occurred in 7 (36.8%) of them. In the otologic examination 1 patient sustained a tympanic membrane perforation, 4/23 (17%) had tinnitus, 7/23 (30%) had vertigo, and 2/23 (9%) had aural fullness. **Conclusions:** This study demonstrates that a wide array of otologic injuries is sustained following airbag deployment. To our knowledge this is the first systematic, prospective observational study in the otolaryngologic literature to determine the incidence of otologic trauma after airbag deployment and to discuss the mechanisms of airbag induced injury to the auditory system. It is important to be cognizant of the potential injuries from airbag deployment since airbag use is widespread. Recognition of injury patterns is a logical step toward more effective and safe airbag design and modification. Refinements in airbag design may reduce both the incidence and severity of this injury spectrum.

M2. The Effect of Basic Fibroblastic Growth Factor on Cartilage Regrowth in Tracheal Wound Healing

Samuel S. Bailey, MD, Chicago, IL (Resident Travel Award)

David L. Walner, MD, Chicago, IL

Noah P. Parker, BA, Chicago, IL

David D. Caldarelli, MD, Chicago, IL*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the effects of FGF-2 and hyaluronic acid on tracheal wounds in a rabbit model; and 2) explain the utility and possible applications of hyaluronate and FGF-2 in cartilage and tracheal wound healing.

Objectives: Various methods have been studied to improve tracheal healing after surgery. Several studies have demonstrated

that basic fibroblastic growth factor (FGF-2) increases cartilage repair and chondrocyte migration velocity in articular cartilage wounds. However, the effects of FGF-2 have yet to be studied in respect to tracheal wound healing and cartilage regrowth. Experiments have also demonstrated the benefits of hyaluronic acid (HA) not only in wound healing in the tympanic membrane, skin, and articular cartilage but also in decreasing postoperative adhesions. The goal of this project was to study the effects of HA and FGF-2 on tracheal wound healing. **Study Design:** Thirty-three New Zealand White Rabbits (22 experimental, 11 control) had a 2mm round defect created in the third tracheal ring. The experimental groups had an 8mm round sodium hyaluronate based sponge fixed over the defect using fibrin glue. The first experimental group had only the sponge placed over the defect, while the sponge of the second experimental group was saturated with a 10ng/ml solution of FGF-2. The control group had only an 8mm collagen sponge placed over the defect and secured with the fibrin glue. **Methods:** Tracheal tissue was harvested at 12 weeks postop and histologically scored with regard to inflammation, connective tissue organization, epithelial closure, chondrocyte death, and cartilage regeneration (clonal cell formation) at the area of injury. Statistical analysis was done using the Mann-Whitney U and Kruskal-Wallis tests. **Results:** Clonal cell formation was significantly increased at the area of injury in the FGF-2 group compared to controls ($p=0.032$). This significance was not seen between the HA and control groups. There was a significant decrease in inflammatory cell infiltration at the site of injury when controls were compared to both the HA ($p=0.011$) and FGF-2 ($p=0.004$) groups. No significant differences were seen in connective tissue organization, cell death or epithelial closure. **Conclusions:** These results suggest that FGF-2 induce clonal cell formation in tracheal wounds in a rabbit model. The addition of HA and FGF-2 to tracheal wounds resulted in a significant decrease in inflammation. Although not statistically significant, an increase in connective tissue organization and decrease in cell death was observed in the experimental groups when compared to controls. Poor wound healing, cartilage damage and scar formation can contribute to airway compromise after tracheal surgery or reconstruction, especially in the infant larynx. These results suggest that HA and FGF-2 may be useful as an adjunct in improving post-operative tracheal repair.

M3. Development of a Nano-Composite as a Biomimetic Bone Substitute Material: A Biocompatibility Study Using the Rat Subdermal Model

Anca Barbu, MD, Cleveland, OH

Jonathan Z. Baskin, MD, Cleveland, OH (Presenter)

Steven J. Eppell, PhD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the parameters that are important for producing a biomimetic bone substitute material that is load bearing, resorbable and biocompatible.

Objectives: Using a rodent subdermal model assess biocompatibility and tissue integration of a synthetic material developed as a load bearing bone substitute. **Study Design:** Prospective animal study. **Methods:** A novel biomimetic composite was fabricated from type I collagen and a mineral (carbonated-apatite) nanophase. Strength/porosity ratios were varied by altering the mode of mechanical dehydration (modulus range of 50-800MPa and pore volume of 5-20%). Construct stability was enhanced by either glycation or dialdehyde mediated crosslinking (D-ribose and glyoxal). 6 samples with an increasing range of strength/porosity ratios and 2 clinically approved bone substitutes (controls) were subdermally implanted in each of 6 Sprague-Dawley rats for 2 weeks. Specimen were grossly and histologically examined for an inflammatory response, foreign body reaction, the presence of a fibrous capsule (tissue/material interface), and cellular infiltration. **Results:** None of the implants were complicated by infection, extrusion, or gross inflammation. The material with the lowest strength/porosity profiles was most rapidly resorbed. Crosslinking created the most resistance to biological degradation regardless of the mode of mechanical dehydration. There were minimal signs of a foreign body or inflammatory response in all samples. Robust cellular ingrowth occurred in non-crosslinked samples resulting in ill defined tissue/material interface. Crosslinked samples (regardless of agent used) had the most defined fibrous capsule and lowest degree of cellular invasion. **Conclusions:** A synthetic bone substitute composed of biological substrates can be manufactured to be load bearing, resorbable, and biocompatible. Structural parameters such as strength, porosity, and construct stability can be altered to predictably influence tissue integration and resorption rate.

M4. Secreting Jugulotympanic Paraganglioma with Extensive Venous Involvement into the Thorax

Opeyemi O. Daramola, BS, Minneapolis, MN

Michael J. Shinnars, MD, Minneapolis, MN

Samuel C. Levine, MD, Minneapolis, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to: 1) discuss pharmacological options in managing secreting jugulotympanic paragangliomas; and 2) discuss radiological studies and interventions useful in minimizing vascular complications while resecting jugulotympanic paragangliomas.

Objectives: Functional jugulotympanic paragangliomas with significant thoracic extension are rare. The presentation, diagnosis and management of such a case are presented. **Study Design:** Case report. **Methods:** Review of patient records. **Results:** A 56 year old woman with a history of a left conductive hearing loss and hypertension inadequately managed by atenolol presented with pulsatile tinnitus, hoarseness and dysphagia. Examination revealed paresis of cranial nerves nine

through twelve. The mass was extending medially to the tympanic membrane into the external auditory canal. Audiogram demonstrated a 30 dB conductive hearing loss with a type B tympanogram. MR imaging revealed a left jugular bulb mass with middle ear extension. Inferior extent was not determined on the preoperative MRI or CT scan. Serum norepinephrine was elevated. Subtotal resection was accomplished using a combination of a transmastoid and upper neck dissection approaches. The internal jugular vein portion of the tumor measured 15 cm and extended into the thorax. The patient recovered without complications. **Conclusions:** MRI, CT scans should be conducted preoperatively to characterize margins and bony erosion. The preoperative imaging should include the neck to characterize the inferior extent of disease to aid in preoperative planning. In this case thoracic extension was unexpected secondary to the limited inferior extent of the preoperative imaging.

M5. Mortality Rate of Morbidly Obese Patients after Tracheotomy

Ilaaf Darrat, MD, Detroit, MI

Kathleen L. Yaremchuk, MD, Detroit, MI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the need to convey the increased mortality rate after tracheotomy in patients who are morbidly obese to our patients and families.

Objectives: 1) To determine the mortality rate of morbidly obese patients after tracheotomy; 2) to determine the difference between the mortality rate after tracheotomy of the morbidly obese patients and patients who are not morbidly obese; and 3) to determine the difference between the mortality rate after tracheotomy adjusted for case mix index (CMI) of the morbidly obese patients and patients who are not morbidly obese. **Study Design:** Retrospective cohort study of 278 patients who had undergone a tracheotomy by the otolaryngology head and neck surgery department from 2004-2006. The patients were subdivided into two groups: 1) BMI less than 35 (n=229); and 2) BMI greater than or equal to 35 [morbidly obese] (n=49). **Methods:** Charts reviewed for age, sex, weight, height, body mass index, indication for tracheotomy, date of tracheotomy, type of tracheotomy, date of discharge, date of death, length of hospital stay, CMI. **Results:** There is a trend toward significance (p value = 0.09) between the mortality rate after tracheotomy of the morbidly obese patients (29%) and patients who are not morbidly obese (18%). The mortality rate for all of the patients based on CMI is significantly related to the mortality rate for the patient population as a whole (p value <0.01). There is less significance between the adjusted mortality rate, based on CMI, after tracheotomy when the patient population is divided into the morbidly obese patients and patients who are not morbidly obese (p value = 0.12). **Conclusions:** The mortality rate after tracheotomy of morbidly obese patients is greater than patients who are not morbidly obese.

M6. Inverting Papilloma Associated with Oroantral Fistula

Julian Dixon, MD, Chicago, IL

Rakesh K. Chandra, MD, Chicago, IL

Robert C. Kern, MD, Chicago, IL*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss salient features of occult inverting papilloma involving the maxillary sinus.

Objectives: Oroantral fistula is an occasional and unfortunate complication of maxillary dental extraction that may be further complicated by odontogenic sinusitis. Inverting papilloma is the most common benign true neoplasm of the sinonasal tract and often involves the maxillary sinus. We review coexistence of these entities. **Study Design:** Retrospective. **Methods:** Case report and literature review. **Results:** A 44 year old female with right maxillary pain underwent tooth extraction 3 months prior, which was complicated by an oroantral fistula and chronic maxillary sinusitis. Mixed flora, including viridans streptococci and Pepto streptococci, were recovered by both middle meatal swab and via passage of a calgi-swab into the fistula tract. The patient failed two attempts at transoral fistula closure, as well as 3 months of continued oral antibiotics, and was thus referred for ESS. Intraoperative findings revealed frank purulence associated with a fleshy mass at the right maxillary sinus floor. Frozen section biopsy revealed inverting papilloma and the procedure was terminated. The patient was counseled, and one week later she underwent endoscopic assisted resection of the neoplasm in conjunction with a Caldwell-Luc approach. No malignancy was identified. By 3 months postoperatively the patient had experienced complete resolution of symptoms and spontaneous closure of the fistula. She remains disease free at 6 months postoperatively. **Conclusions:** The patient's maxillary dental symptoms may have been secondary to the occult neoplasia, and development of an oroantral fistula may have been suggestive of underlying pathology. Use of angled telescopes is necessary to carefully evaluate the sinus lumen intraoperatively.

M7. Recurrent Unilateral Periorbital Cellulitis in a Pediatric Patient—An Anatomic Abnormality

Kris R. Jatana, MD, Columbus, OH (Resident Travel Award)

Matthew J. Skomorowski, BS, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to gain an understanding of recurrent periorbital cellulitis in a pediatric patient, and the importance of identifying anatomical changes for which surgical intervention can be curative.

Objectives: To report a case of recurrent unilateral periorbital cellulitis in a pediatric patient. **Study Design:** Case report and review of literature. **Methods:** A detailed clinical history, CT/MRI imaging, and intraoperative images are presented and the current literature is reviewed. **Results:** A two year old male, otherwise healthy, suffered a total of seven episodes of recurrent right sided periorbital cellulitis which began at eleven months of age. Five of the seven episodes of right eye swelling/erythema required hospital admission for IV antibiotics; two were treated with oral antibiotics as an outpatient. All episodes responded to antibiotic therapy. Immunologic workup was negative. Imaging studies demonstrated a connection between the ethmoid and the orbit through a well defined dehiscence in the lamina papyracea. Endoscopic sinus surgery was performed and the patient had no further infections. **Conclusions:** Although there have been very few reports in the literature recurrent periorbital cellulitis can occur in the pediatric population. This case demonstrates a clear dehiscence in the lamina papyracea as the underlying etiology. High resolution imaging studies in pediatric patients with recurrent periorbital cellulitis could identify those who would benefit from early surgical intervention.

M8. Inhibition of Adenoid Cystic Cancer via Combination Chemotherapy and PPAR Gamma Activation in Vitro

Wudel M. Justin, BS, Minneapolis, MN

Beverly R. Wuertz, BA, Minneapolis, MN

Frank G. Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the rationale for the combination of chemotherapy and pioglitazone as novel treatments for adenoid cystic cancer.

Objectives: Adenoid cystic cancer is a rare, difficult to treat cancer. There is no curative treatment for recurrent disease. In the present study we combined standard chemotherapy with the PPAR gamma activator, pioglitazone, a novel anticancer agent currently used for diabetes treatment. PPAR gamma activators function by global transcriptional activation of nuclear receptor pathways central to cell proliferation and differentiation. **Study Design:** In vitro cell line study. **Methods:** We treated adenoid cystic cells (ACC-3) with pioglitazone in combination with three agents currently used to treat adenoid cystic cancer clinically: doxorubicin, 5-fluorouracil, and cisplatin. Using repeated MTT cell proliferation assays (5 replicates/condition). **Results:** Cell proliferation was not decreased significantly with the combination of doxorubicin and 10uM pioglitazone within clinically achievable doses (up to 50ng/mL). However at higher doses (100 and 200ng/mL) doxorubicin killed 25% and 40% of the total cell population. Cisplatin decreased cell proliferation in the ACC3 cells within clinically achievable doses (up to 20uM). The combination of 10uM pioglitazone and cisplatin also significantly inhibited cell proliferation. However the decrease in proliferation was not significantly more than that of either agent individually. The combination of 100 uM 5-fluorouracil and 10uM pioglitazone significantly decreased cell proliferation in a superadditive fashion (all p values <0.05). To summarize pioglitazone was an effective antiproliferative agent by itself or in combination with standard chemotherapy agents used at clinically achievable doses. **Conclusions:** We conclude that combination therapy with standard chemotherapy and pioglitazone nuclear receptor targeting represents a unique strategy for this disease that can be translated to the clinic. Platinum and 5 FU may be the best combination agents based on our preclinical studies.

M9. Massive Parathyroid Adenoma: Missed without Proper Workup

Alexander J. Langerman, MD, Chicago, IL (Resident Travel Award)

Elizabeth A. Blair, MD, Chicago, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the workup for primary hyperparathyroidism, localization studies, and the use of intraoperative parathyroid hormone (PTH) levels.

Objectives: To review the workup for primary hyperparathyroidism, localization studies, and the use of intraoperative parathyroid hormone (PTH) levels. **Study Design:** Case report. **Methods:** We review a case of a patient referred to our hospital with symptomatic hypercalcemia and an eight centimeter, 26 gram parathyroid adenoma. This had been missed during the workup for his hypercalcemia which included bilateral neck exploration and presumptive contralateral thyroid lobectomy. The appropriate preoperative workup and localization studies for primary hyperparathyroidism were not performed, and the surgery failed to correct his hypercalcemia. These studies were performed at our institution and revealed the adenoma which was successfully treated. **Results:** Patients presenting with elevated calcium and PTH levels should have a metabolic workup and preoperative localizing studies such as sestamibi scan and/or neck ultrasound prior to operative intervention. Intraoperative assessment of rapid PTH levels confirms that all hyperfunctioning parathyroid tissue is excised. **Conclusions:** This case highlights the bene-

fit of preoperative localization studies and the intraoperative confirmation of corrected PTH levels in the treatment of primary hyperparathyroidism.

M10. Neuronal Differentiation of Mesenchymal Stem Cells in an Animal Model of Auditory Neuropathy

Akihiro J. Matsuoka, MD PhD, Indianapolis, IN (Resident Travel Award)

Takako Kondo, PhD, Indianapolis, IN

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

Eri Hashino, PhD, Indianapolis, IN

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss potential treatment for sensorineural hearing loss by bone marrow stem cell transplantation into the cochlea.

Objectives: Currently cochlear implants have been the primary means of treating profound sensorineural hearing loss. Some degree of preservation of spiral ganglion neurons is considered to be of primary importance for speech recognition and oral language development. To further improve outcome of current cochlear implant a technology to restore SGNs is crucial. This preliminary study is to demonstrate that combination of neuronal induction medium and Wnt1 may potentiate sensory neuronal differentiation of transplanted mesenchymal stem cells (MSCs) into the modiolus of the Mongolian gerbils in vivo. **Study Design:** MSCs were isolated from a 4-6 week old TgN(ACTbEGFP) mouse (donor) and eight Mongolian gerbils deafened by ouabain were used as recipients. **Methods:** MSCs were isolated from a 4-6 week old TgN(ACTbEGFP) mouse (donor) and eight Mongolian gerbils deafened by ouabain were used as recipients. **Results:** Undifferentiated MSCs transplanted into the modiolus survived even 24 days after transplantation with osmotic pump infusion of NIM and Wnt1. Some of these cells no longer maintained a typical flat mesenchymal cell shape, instead they exhibited spherical, refractile cell bodies and long axon-like processes with NIM and Wnt1. **Conclusions:** Combination of neuronal induction medium and Wnt1 may potentiate sensory neuronal differentiation of transplanted MSCs in vivo. Further studies such as immunohistochemical staining will be needed to evaluate neuronal characteristics of these cells.

M11. Relationships between ECAP Thresholds and Behavioral Measures for the Nucleus Freedom Device

Eric J. May, BA, Milwaukee, WI

Christina L. Runge-Samuels, PhD, Milwaukee, WI

P. Ashley Wackym, MD, Milwaukee, WI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss relationships between electrically evoked compound action potential thresholds and behavioral outcomes for cochlear implant patients.

Objectives: The specific aim of this study was to compare intraoperative electrically evoked compound action potential (ECAP) thresholds with postoperative cochlear implant outcomes in patients implanted with the Nucleus Freedom device. **Study Design:** The study is a retrospective chart review of adult patients implanted with a Nucleus Freedom device at our center. **Methods:** ECAP thresholds were compared with several behavioral measures: behavioral thresholds (Ts) and maximal comfort loudness levels (Cs) at device hookup, Ts and Cs at 6 months post-hookup, and speech perception scores at 6 months post-hookup. **Results:** Data were collected for 39 patients (227 electrodes), and intraoperative ECAPs were obtainable on 95% of the electrodes. Analyses showed correlations between ECAP thresholds and both Ts and Cs with higher ECAP thresholds consistent with higher stimulation levels for both measures. Programming stimulation rate was a factor with correlations seen for the lower rates (900-1200) but not observed for the higher rates (1800-2400). Significant correlations were found between ECAP thresholds and speech perception measures in quiet with performance scores decreasing with increases in ECAP threshold. No significant relationship was observed between ECAP threshold and speech perception in noise. **Conclusions:** ECAP thresholds indicate some predictive relationships with behavioral measures in the Nucleus Freedom device. These results are likely to be clinically useful, particularly when initially fitting devices for children or other individuals with little auditory experience.

M12. Bone Anchor Suspension for Nasal Valve Collapse: A High Rate of Complications

Colby G. McLaurin, MD, Oklahoma City, OK (Resident Travel Award)

John R. Houck, MD, Oklahoma City, OK

Wes A. Allison, MD, Louisville, KY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the rate of complications and patient satisfaction using the MITEK bone anchor technique for nasal valve suspension.

Objectives: To describe the rate of complications and patient satisfaction using the MITEK bone anchor suspension system technique for nasal valve suspension. **Study Design:** This is a long term, retrospective review of patients with nasal airway obstruction treated with the bone anchor suspension technique (BAST). Eight patients underwent BAST over a 2½ year period from 2002-2004. **Methods:** The surgical technique involved fixing a MITEK bone anchor into the infraorbital rim through a 4mm stab incision, passing the attached sutures through the nasal valve area, and securing them to open the valve. Both preoperative and postoperative clinic visit notes were analyzed to assess complications and subjective patient satisfaction. Operative notes were reviewed for any deviation from the standard technique. **Results:** By 6 months postoperatively 3 of 8 patients (37.5%) had required removal of the bone anchor and suspension suture for recurrent infections or abscess. Only 2 of 8 (25%) reported subjective satisfaction and improvement of nasal airway with the rest reporting no improvement in symptoms or complaints of pain in and infection of the implant. **Conclusions:** Actual rates of complications in BAST for nasal valve suspension may be higher than previously reported. The complication rate and functional results limit the use of BAST for surgical treatment of nasal valve collapse.

M13. Recurrent Benign Fibrous Histiocytoma of the Larynx in a Young Female: A Case Report

Carl W. Moeller, MD, Maywood, IL

Lee M. Akst, MD, Maywood, IL

Andrew J. Hotaling, MD, Maywood, IL

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the rarity of benign fibrous histiocytoma of the larynx in the pediatric population as well as understand typical clinical presentation and available treatment modalities for recurrent disease.

Objectives: To understand the rarity of benign fibrous histiocytoma of the larynx in the pediatric population, typical clinical presentation, and available treatment modalities for recurrent disease. **Study Design:** Case report. **Methods:** Review of individual patient's operative reports, pathologic data, and clinical history. **Results:** Benign fibrous histiocytomas are a diverse group of spindle cell neoplasms that generally occur on the skin and are composed of fibroblastic and histiocytic cells. Fibrous histiocytoma of the larynx is rare and is usually malignant. We present a report of an adolescent girl with recurrent benign subglottic fibrous histiocytoma. The patient initially presented at age nine with airway obstruction. The lesion was subtotally resected by a community otolaryngologist before the patient was referred to our academic medical center. Upon initial direct laryngobronchoscopy, friable, granular tissue on the posterior subglottis was noted to cause a 50% obstruction. The lesion was removed with a microdebrider and sent for pathologic analysis. Distinctive storiform cellular pattern and immunohistochemical profile were consistent with a diagnosis of benign fibrous histiocytoma. The child is now fifteen years old and has undergone biannual direct laryngobronchoscopy, biopsy, and resection as needed. Most recently recurrent neoplasm was treated with pulsed-KTP laser photoangiolytic. The patient has remained asymptomatic despite recurrence of benign disease. **Conclusions:** Benign fibrous histiocytoma of the larynx in the pediatric population is unusual and has been rarely reported in the literature. Our experience with a child with recurrent disease provides insight into the nature and management of benign fibrous histiocytoma of the larynx.

M14. Vidian Nerve Schwannoma: Diagnosis and Management

Patrick D. Munson, MD, Rochester, MN

Jan L. Kasperbauer, MD, Rochester, MN*

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate anatomic and radiologic knowledge of a vidian nerve schwannoma and understand the diagnosis, endoscopic surgical approach, and followup of such patients.

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

tive radiosurgery. Schwannomas may originate from any peripheral, cranial, or autonomic nerve.

M15. Case Report: Lacrosse Related Laryngeal Injury

Jeff C. Rastatter, MD, Columbus, OH
Kris R. Jatana, MD, Columbus, OH
Lindsay Leininger, MD, Columbus, OH
Jeff A. Hall, MD, Columbus, OH
James D. Lowery, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be sensitive to the potential of contact sports, in this case lacrosse, to cause life threatening laryngeal injury and be able to discuss current literature on blunt pediatric laryngeal trauma.

Objectives: To present a case of blunt laryngeal injury caused during a lacrosse game in which surgical repair with careful mucosal coverage of exposed cartilage lead to a good voice result. **Study Design:** Case report and literature review. **Methods:** Comprehensive case presentation including CT imaging, intraoperative photographs, and postoperative followup laryngoscopy of a teenage male hit in the neck with a lacrosse stick. **Results:** A 15 year old male presented to the emergency room after sustaining blunt injury to the anterior neck with a lacrosse stick. There was no acute respiratory distress; however the patient was extremely hoarse. No neck crepitus was present and the thyroid lamina was intact on palpation. CT scan demonstrated laryngeal injury and flexible fiberoptic laryngoscopy showed visible right arytenoid cartilage. The patient underwent immediate tracheotomy, direct laryngoscopy and bronchoscopy prior to definitive laryngofissure approach with repair of the laryngeal injury. The patient was successfully decannulated two weeks postoperatively, and cartilage repositioning with meticulous closure of mucosal edges produced a good voice outcome. **Conclusions:** In blunt laryngeal trauma the potential for rapid airway compromise makes early recognition and prompt evaluation by appropriate emergency personnel critical. Those involved with contact sports on the playing fields should be aware such a mechanism for severe injury exists.

M16. Cigarette Smoke Carcinogens Induce NF Kappa B Activity in Precancerous Aerodigestive Cells

Joseph W. Rohrer, BS, Minneapolis, MN
Beverly R. Wuertz, BS, Minneapolis, MN
Frank G. Ondrey, MD PhD, Minneapolis, MN

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the role of NF kappa B in aerodigestive cancer. This includes chronic inflammation and loss of apoptosis. Understand how carcinogens from cigarette smoke induce NF kappa B and its downstream products and understand a possible role for chemoprevention on this site.

Objectives: Aerodigestive cancer risk has been linked to tobacco use in both lung and head and neck cancers due to tobacco genotoxic effects. Upregulation of NF kappa B and its downstream products is associated with both lung and head and neck cancer malignant progression. **Study Design:** In the present study we examined the effects of cigarette smoke condensate on functional activation of NF kappa B in HPV transformed oral cavity cells (HOK cells) and transformed bronchial epithelium (Beas2B cells) using the head and neck squamous cancer cell line, UM SCC 38, as a comparison. **Methods:** Luciferase reporter gene assays with 2 types of transiently transfected NF kappa B reporter genes were employed. **Results:** All cell lines were able to dose dependently activate NF kappa B reporter genes after the exposure to cigarette smoke condensate ($P < 0.05$). However the premalignant, transformed cell lines had a much more robust NF kappa B response (greater than 3.45 fold) versus the squamous cancer cell line (only 1.62 fold). Both NF kappa B reporter genes had similar response curves. **Conclusions:** This study demonstrates cigarette smoke products may be more potent promoters of an NF kappa B dependent carcinogenesis progression from premalignancy to cancer rather than from cancer to metastases. Future studies should focus on abrogating the NF kappa B DURING malignant progression and premalignancy. This may be even more important if HPV transfected premalignant cells are more sensitive to NF kappa B stimulatory events than overtly cancerous head and neck cells.

M17. Broccoli within the Thyroid Gland—A Case of Type IV Branchial Cleft Fistula

Cherie Ryoo, MD, Columbus, OH
Kris R. Jatana, MD, Columbus, OH
Bonita R. Fung, MD, Columbus, OH
Charles A. Elmaraghy, MD, Columbus, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to gain an understanding of type IV branchial cleft fistulas and the potential for food debris to act as nidus for recurrent infections within the thyroid gland.

Objectives: To report the first case of a type IV branchial cleft fistula resulting in vegetable debris within the thyroid gland. **Study Design:** Case report and review of literature. **Methods:** A detailed clinical history, preoperative CT scan, pre-/postoperative esophagrams, and histopathology are presented and the current literature is reviewed. **Results:** An eight year old male presented with a one month history of intermittent anterior neck pain, swelling, and erythema. An ultrasound obtained at presentation was suspicious for a mass slightly left of midline contiguous with the lower lobe of the left thyroid gland. This was further confirmed with a CT scan which also demonstrated a one centimeter mass within the gland. Esophagram demonstrated a left pyriform sinus fistula. After resolution of the initial infection and abscess, a direct microlaryngoscopy with cauterization of the fistula orifice and left thyroid lobectomy was performed. Interestingly histopathologic examination of the thyroid tissue documented vegetable matter within the gland parenchyma. The patient suffered no complications and had no recurrence of symptoms or fistula postoperatively. **Conclusions:** Type IV branchial cleft fistulas can occur with extension to the thyroid gland. Food debris can be identified within the thyroid gland and creates a nidus for recurrent infection. Surgical management can be curative.

M18. Expression of Mucin (MUC) Genes in Mucoepidermoid Carcinoma: Analysis of MUC 1, 4, 12, 13, 17, 18, and 19

Nima L. Shemirani, MD, Milwaukee, WI (Resident Travel Award)

Vladimir O. Osipov, MD, Milwaukee, WI

Alex A. Kolker, PhD, Milwaukee, WI

Joseph E. Kerschner, MD, Milwaukee, WI*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss which MUC genes are suggestive of mucoepidermoid carcinoma and how its differential expression changes with stage of disease.

Objectives: Mucoepidermoid carcinoma (MEC) is the most common malignant salivary gland tumor. The presence of mucin (MUC) genes has been correlated with patient prognosis using immunohistochemical techniques. This study was undertaken to: 1) investigate the expression of newly discovered MUC genes in MEC specimens; 2) assess the correlation of this expression to prognosis; and 3) further investigate the correlation of previously identified MUC genes to prognosis using molecular techniques. **Study Design:** Retrospective chart review and sample isolation. **Methods:** 23 patients with a diagnosis of MEC underwent mucin gene analysis of tumor and normal surrounding salivary gland tissue. Initial expression analysis of recently identified mucin genes MUC 12, 13, 17, 18, and 19 was performed using reverse transcription polymerase chain reaction (RT-PCR) followed by quantitative assessment with real time RT-PCR. Additional assessment of mucin genes MUC 1 and MUC 4, which have previously been associated with MEC, were also analyzed with real time RT-PCR. **Results:** MEC was associated with MUC 19 expression in 65% of tumor samples compared to only 26% of normal tissue (p=0.02). MUC 18 demonstrated equal expression in both tumor and normal tissue. MUC 12 and 17 were not expressed in either MEC or normal salivary gland. MUC 13 was found in 13% of tumors and 0% of normal samples. MUC 1 and MUC 4 were expressed 4.2 and 21 fold higher in stage I disease in tumor tissue compared to normal respectively. **Conclusions:** Presence of MUC 19 is suggestive of mucoepidermoid carcinoma and higher expression of MUC 1 and MUC4 is correlated with earlier stage disease.

M19. The Sleep Apnea Disability Index as a Patient Assessed Quality of Life Measure

Thomas C. Spalla, MD, Detroit, MI

Kathleen L. Yaremchuk, MD, Detroit, MI*

Thomas J. Walker, MD, Coconut Grove, FL

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the potential ways in which sleep disorders may interfere with a patient's life and the difficulty in predicting sleep apnea based on history alone.

Objectives: The study sought to develop a questionnaire evaluating a patients' self-assessed disability attributable to their perceived sleep disorder and relate these responses to polysomnogram results. **Study Design:** Prospective observational. **Methods:** A 47 item questionnaire entitled the Sleep Apnea Disability Index (SAD Index) was created based upon three broad categories in which patients may be affected by obstructive sleep apnea: physical, functional, and emotional. This was given to 116 (56 males, 60 females) consecutive patients undergoing polysomnography with complaints of sleep disturbances to evaluate the potential for sleep apnea. Patients having an overnight sleep study were given this questionnaire and asked to circle the one best response representing their perceived disability attributable to their sleep problems. **Results:** Nearly 48% of the patients in our study undergoing PSGs did not have sleep apnea. A BMI greater than 40 was associated with an odds ratio of 5.77 for having sleep apnea when compared to patients with a BMI of less than 25. Logistic regression revealed that in our patient population, being ashamed of the sleep disorder was associated with a 38% increased chance of having sleep apnea

on the PSG. However having difficulty concentrating, remembering things, reporting fatigue at work, and having difficulty with paperwork actually was associated with a 31% decreased chance of having sleep apnea. Reporting difficulty in operating a car long distances was associated with a 24% decreased chance of having sleep apnea. **Conclusions:** This study illustrates the difficulty in predicting sleep apnea in patients based on history alone. Further work must be performed in developing a questionnaire that may aid in predicting sleep apnea thereby reducing the number of unnecessary polysomnograms.

M20. THIRD PRIZE - HENRY WILLIAMS RESIDENT RESEARCH AWARD **Wound Healing in the Rabbit Paranasal Sinuses after Coblation Surgery**

Laura H. Swibel Rosenthal, MD, Detroit, MI

Michael S. Benninger, MD, Detroit, MI*

Chad H. Stone, MD, Detroit, MI

Mark A. Zacharek, MD, Detroit, MI

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the effects of the coblator on paranasal mucosa and begin to evaluate its safety and usefulness as a potential tool for sinus surgery.

Objectives: To determine the extent of injury in the paranasal sinuses with electro-dissociation and evaluate healing. **Study Design:** Eight rabbits underwent coblation of maxillary sinus mucosa. Three also underwent coblation of ethmoid sinus mucosa over the lamina papyracea. Biopsies were obtained immediately and on postoperative days 3, 7, 14, and 29. **Methods:** Maxillary mucosa was exposed through the nasal dorsum, and a coblator PROcise XP wand used on an ablation setting of 7 for 2 seconds to create a solitary lesion. For three rabbits after extending the maxillary osteotomy a lesion was also created in the ethmoid. In these rabbits the maxillary mucosa was stripped and the ethmoid sinus resected en bloc immediately after injury. The remaining maxillary sinus specimens were removed en bloc during necropsy. **Results:** Coblation resulted in immediate loss of surface respiratory epithelium and thermal type injury to the underlying seromucinous glands. On postoperative day (POD) 3, the site demonstrated reepithelialization by squamous metaplastic epithelium. The seromucinous glands underwent coagulative necrosis. At POD 7 there was partial replacement of respiratory epithelium. The underlying seromucinous glands were lost and replaced by fibroblastic proliferation. The underlying bone had reactive, regenerative changes, with less fibrosis than the ostomy site. On POD 14 and 29 there was further regeneration of respiratory epithelium. Fibrosis was mild. Coblation resulted in gross violation of the medial maxillary wall in one of 10 sinuses. There were no histologic changes in the orbit. **Conclusions:** Rabbit paranasal sinus mucosa heals appropriately after coblation injury.

M21. Fourth Branchial Anomaly: Endoscopic Management Revisited

Neil Tanna, MD, Washington, DC

Lindsay S. Eisler, MD, Washington, DC

George H. Zalzal, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the management of a rare cause of pediatric neck masses.

Objectives: The authors aim to review the embryology, clinical presentation, evaluation including radiographic and histologic findings, and management of a rare cause of pediatric neck masses. **Study Design:** Case report and review of the literature. **Methods:** Tertiary care children's hospital. **Results:** A four year old male presented with a one day history of fever, odynophagia, and left lateral neck swelling. Imaging demonstrated a 2.2 cm round, rim enhancing lesion with air pockets and loculations. The collection was at the level of the thyroid gland and displaced the trachea to the right. Clinical suspicion for a branchial cleft anomaly prompted initial direct laryngoscopy. With palpation of the left neck purulence was expressed from the ipsilateral pyriform sinus. The apex of the left pyriform sinus was probed with a soft catheter thereby confirming the sinus tract. Plans for cervical incision and drainage were held. Definitive excision was planned for after resolution of the acute inflammatory episode. **Conclusions:** Fourth branchial apparatus anomalies remain a rare cause of pediatric neck masses. Clinical suspicion warrants vigilant evaluation and management. These anomalies may be mislabeled as recurrent deep neck abscesses that do not respond to appropriate medical or surgical therapy, recurrent acute suppurative thyroiditis, respiratory distress, or retropharyngeal abscesses. Failure to recognize fourth branchial apparatus anomalies may result in repeated incision and drainages. Ultimately this may predispose the child to an incomplete excision of the anomaly.

M22. Submandibular Sialolipoma: Clinician Be Aware

Neil Tanna, MD, Washington, DC

Douglas Sidell, MD, Los Angeles, CA

Matthew Clary, MD, Washington, DC

Nader Sadeghi, MD, Washington, DC

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate current concepts in diagnosis and management of submandibular sialolipomas.

Objectives: The authors aim to review the clinical evaluation including radiographic and histopathologic features and management of an uncommon cause of an enlarging neck mass. **Study Design:** By reviewing a clinical case from a series of patients within our practice we will highlight the clinical presentation and management of submandibular sialolipomas. **Methods:** Case report and review of the literature. **Results:** A 46 year old female presented with a six month history of a slowly enlarging, painless, left neck mass. Palpation of the left neck demonstrated a nontender, mobile, soft nodule inferior to the mandibular angle. Fine needle aspiration revealed salivary gland acini and a polymorphous population of lymphoid cells with mature fragments of adipose tissue. Subsequent contrast enhanced computed tomography demonstrated a 3.3 cm left neck mass posterior to the submandibular gland and inferior to the parotid gland with imaging characteristics consistent with a lipoma. Intraoperatively the mass was noted to encase both the marginal mandibular and great auricular nerves. The postoperative course was complicated only by transient paresis of the marginal mandibular nerve. **Conclusions:** While sialolipoma remains an uncommon cause of an enlarging neck mass, it is becoming a more frequent diagnosis since its original designation in 2001. The accuracy of imaging studies and histopathologic technique, as well as the effectiveness of surgical resection as treatment, make the accurate diagnosis of sialolipoma one of importance. Untreated sialolipomas can become involved with adjacent nerves, glands and muscles, influencing the clinical presentation and respectability of the lesion. Similar to extra-salivary lipomas complete resection of sialolipomas is of utmost importance to avoid recurrence of disease.

M23. Mantle Cell Lymphoma Presenting as an Upper Airway Obstruction

Mary E. Williamson, MD, Cleveland, OH
Walter T. Lee, MD, Cleveland, OH

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize and discuss the management of a primary mantle cell lymphoma as an obstruction oropharyngeal mass.

Objectives: The report upon an unusual presentation and management of an almost complete upper airway obstruction caused by a primary oropharyngeal mantle cell lymphoma. **Study Design:** Case report. **Methods:** Retrospective chart review. **Results:** The patient presented with impending airway obstruction with a mass of unknown etiology of the upper airway. The patient underwent emergent awake tracheostomy for immediate airway management. This was followed by biopsy and debulking of the mass. Once the diagnosis of mantle cell lymphoma was confirmed by pathology the patient underwent chemotherapy. The patient has since been successfully decannulated. **Conclusions:** Mantle cell lymphoma can present as a tumor focus with upper airway obstruction. A combined treatment of airway management, debulking and chemotherapy allowed for definitive treatment and early decannulation.
