

SOUTHERN SECTION PROGRAM

THURSDAY, JANUARY 9, 2003

- 2:30 **Registration** – Crystal Foyer
5:30
- 3:00 **Speaker Ready Room** – To Be Announced
9:00
- 6:00 **Welcome/President's Reception** – Sunset Deck
7:30

FRIDAY, JANUARY 10, 2003

- 7:00 - **Registration** - Crystal Foyer
Noon
- 7:00 - **Business Meeting (Members Only)** - Crystal V
7:50
- 7:00 - **Continental Breakfast with Exhibitors** - Crystal I - III
7:50
- 7:00 - **Speaker Ready Room** - To Be Announced
5:00
- 8:00 - **Scientific Sessions** - Crystal IV
12:35
- 8:00 **Welcome and Introduction of Roger L. Crumley, MD*, President**
Robert H. Ossoff, DMD, MD*, Nashville, TN
- 8:05 **Presidential Address**
Roger L. Crumley, MD*, Irvine, CA
- 8:15 **Introduction of Guest of Honor, Harold C. Pillsbury, MD*, Chapel Hill, NC**
Robert H. Ossoff, DMD, MD*, Nashville, TN
- 8:20 **Remarks by Guest of Honor: Citizenship in Medicine - What We Can Do as Otolaryngologists - Head and Neck Surgeons?**
Harold C. Pillsbury, MD*, Chapel Hill, NC
- 8:30 **Vice-Presidential Citations - Paul A. Levine, MD*, Charlottesville, VA, and Stanley M. Shapshay, MD*, Boston, MA**
Robert H. Ossoff, DMD, MD*, Nashville, TN

OTOLOGY SECTION

MODERATOR: THOMAS J. BALKANY, MD*, MIAMI, FL

- 8:40 **Delayed Onset Facial Paralysis After Vestibular Neurectomy**
Jeffrey T. Vrabec, MD, Houston, TX
Newton J. Coker, MD*, Houston, TX
Herman A. Jenkins, MD*, Denver, CO

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss etiology of delayed onset facial paralysis and recognize peri-operative measures that may prevent this complication.

OBJECTIVES: Delayed onset facial paralysis (beginning more than 3 days after the procedure) has been described as a complication of many different types of otologic procedures. The incidence of this problem in vestibular neurectomy and the relationship to surgical approach is detailed in this study. **STUDY DESIGN:** Retrospective case review. **METHODS:** The incidence and outcome of delayed onset facial paralysis (DFP) was investigated in 65 patients with disabling vertigo unresponsive to medical therapy, who elected to undergo vestibular neurectomy. **RESULTS:** DFP was significantly more common after the middle fossa (17%) and translabyrinthine (11%) approaches compared to the retrosigmoid approach (0%). **CONCLUSIONS:** Surgical approach influences the incidence of DFP. Measures to prevent this complication such as prophylactic antiviral medication or labyrinthine segment decompression can be considered in middle fossa and translabyrinthine operations.

- 8:48 **Impact of Mastoidectomy on Simple Tympanic Membrane Perforation Repair**
Benjamin M. McGrew, MD, Birmingham, AL
C. Gary Jackson, MD*, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the effect mastoidectomy has on repair of simple uncomplicated tympanic membrane perforation.

OBJECTIVES: Mastoidectomy has long been identified as an effective method of treatment for chronic ear infection. The effect of Mastoidectomy on patients without evidence of active infectious disease remains highly debated and unproven. The objective in this paper is to examine the impact of Mastoidectomy on the repair of uncomplicated tympanic membrane perforations. **STUDY DESIGN:** 486 patients that underwent surgical repair of simple tympanic membrane perforations were identified and reviewed in a retrospective manner. Simple tympanic membrane perforations were defined as tympanic membrane perfora-

tions of any size and location without any of the following confounding variables: active infection, ossicular abnormalities, cholesteatoma, or prior attempt at tympanic membrane repair. **METHODS:** Surgical outcome and clinical course were assessed to compare results of tympanic membrane perforation repair with and without Canal wall up Mastoidectomy. **RESULTS:** Tympanic membrane repair was equally effective in both groups at 93%. Hearing results were comparable. Development of persistent ipsilateral otologic disease requiring a subsequent ipsilateral procedure was approximately twice as common in the tympanoplasty group. 13 % of the Tympanoplasty group underwent subsequent ipsilateral otologic procedures, and 6.3% of the Tympanoplasty with Mastoidectomy intact canal wall group underwent subsequent procedures. The most common subsequent ipsilateral procedures were tympanostomy tube placement, Tympanoplasty with Mastoidectomy canal wall up, and Tympanoplasty with Mastoidectomy canal wall down in that order. **CONCLUSIONS:** Mastoidectomy was not necessary for successful repair of simple tympanic membrane perforations. However, Mastoidectomy significantly impacted the clinical course in patients by reducing the number of patients requiring future procedures. This suggests that even in the absence of active evidence of infection mastoidectomy positively impacted the underlying disease process. Combining mastoidectomy with tympanoplasty during repair of simple perforations in patients with no active evidence of infection remains an appropriate option and may be valuable in reducing the need for future surgery.

8:56 Intractable Tinnitus: Indications for Cochlear Nerve Section

Jack L. Pulec, MD*, Los Angeles, CA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to identify which patient is likely to benefit from cochlear nerve section and be able to discuss the implications and results of surgery.

OBJECTIVES: Understand the symptoms and findings which indicate that cochlear nerve section can be successful treatment for the disabling tinnitus. **STUDY DESIGN:** Retrospective. **METHODS:** One hundred sixty-eight patients with intractable tinnitus had cochlear nerve section in a tertiary referral center, private otology practice. The pre-operative symptoms, findings, severity and diagnosis were correlated with the post-operative results. **RESULTS:** Complete relief of tinnitus occurred in 116 patients, worthwhile improvement was the result in 45 and 7 obtained no improvement. Those in whom the site of the lesion was uncertain had poorer results. Patients with severe tinnitus and no hope for relief can be at risk for suicide. **CONCLUSIONS:** Cochlear nerve section is an effective treatment for intractable disturbing tinnitus involving the cochlea and cochlear nerve.

9:04 Complications of Cochlear Implant Placement With Minimal and Full Hair Shave

Patrick J. Antonelli, MD*, Gainesville, FL

Nelson S. Howard, BS, Gainesville, FL (*Presenter*)

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants will understand the minimal shave technique and the risks and benefits of this change in procedure.

OBJECTIVES: Traditional cochlear implant technique includes preoperative shave of the entire operative site, which can be esthetically disturbing to the recipient. Minimizing the preoperative shave may alleviate these concerns. The purpose of this study was to compare the incidence of complications during cochlear implantation with a minimal shave technique against a full shave technique. **STUDY DESIGN:** Retrospective study. **METHODS:** Chart review of 158 consecutive patients undergoing primary cochlear implant placement in an academic, tertiary care medical center. Charts were reviewed for all minor or major surgical complications after multi-channel cochlear implant placement performed with either a full operative site shave or a minimal hair shave. **RESULTS:** Early postoperative wound complications were noted in 4 of 105 patients with a minimal shave and 3 of 53 with full shave (3.8% vs. 5.6%). Delayed wound complications were noted in 2 minimal shave and 1 in full shave patients (1.9% vs. 1.8%). Only one wound complication (minimal shave, delayed) required replacement of the implant. **CONCLUSIONS:** Minimal preoperative scalp shave does not adversely affect rates of wound complications in patients undergoing cochlear implant placement.

9:12 Clinical Results With the Med-El Compressed Array in the United States

Peter S. Roland, MD*, Dallas, TX

Paul W. Bauer, MD, Dallas, TX

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) recognize the appropriate clinical conditions for consideration of a compressed array, and 2) know the expected results used if a compressed array is used.

OBJECTIVES: 1) To determine the indications for which the Med-El compressed array has been used in the U.S., 2) to assess the degree of technical success achieved in insertion of the compressed array, 3) to determine hearing outcomes at three and six months, and 4) to determine the rate and type of complications associated with using the compressed array. **STUDY DESIGN:** Retrospective review of data gathered during the U.S. clinical trial. **METHODS:** The medical records in study database for each of the twenty-one patients implanted with the compressed array were analyzed. The following data was collected: 1) indications for use, 2) depth of insertion, 3) number of programmable electrodes, 4) three and six months hearing results, and 5) complications. The results obtained in labyrinthitis ossificans using the compressed array was compared with results using the split array. **RESULTS:** Five adults and sixteen children have been implanted with the compressed array. The principal indications have been either labyrinthitis ossificans or common cavity deformity. Detailed results of hearing outcomes, complication rates and comparison with the split array are provided in the body of the text. **CONCLUSIONS:** The Med-El compressed array is a realistic alternative to a standard or split array in managing labyrinthitis ossificans or common cavity deformity.

9:20 2ND PRIZE - THE G. SLAUGHTER FITZ-HUGH RESIDENT RESEARCH AWARD

Phase Locking in the Auditory Nerve of the Dutch Belted Rabbit

Robert D. Cullen, MD+, Chapel Hill, NC

Douglas C. Fitzpatrick, PhD, Chapel Hill, NC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the importance of phase-locking to the temporal encoding of sound. Participants should also be able to compare the differences in phase-locking that occur in the central and peripheral auditory system.

OBJECTIVES: Phase-locking in the auditory nerve preserves timing information that is used for sound localization and improving signal detection in noise. This information is available only after the timing from the two ears is compared. We have shown that tuning to timing differences between the two ears by central neurons is better than expected for low frequencies. To determine if this improvement is due to central mechanisms or occurs at the periphery we recorded the phase-locking as a function of frequency in the auditory nerve. **STUDY DESIGN:** Single nerve unit recordings in the Dutch belted rabbit. **METHODS:** Under general anesthesia, a tracheotomy was performed to maintain an airway with the subject in a flexed position. The bulla was vented with plastic tubing. An occipital craniectomy was performed with exposure of the cochlear nerve. A glass electrode was microscopically placed in the cochlear nerve. The ipsilateral ear was stimulated acoustically and recordings were taken from the previously placed electrode. The electrode was advanced with a micromanipulator. Individual nerve fibers were characterized with regard to best frequency and phase locking using previously described stimulation algorithms. The subject was euthanized at the end of recordings. Gross anatomic dissection confirmed the correct placement of the electrode. **RESULTS:** Phase locking in the

auditory nerve was on average constant with regard to frequency and thus cannot account for the improvement at low frequencies seen in central neurons. **CONCLUSIONS:** The differential degree of phase locking seen in the IC and DNLL must be the result of central mechanisms, presumably including inhibition to sharpen the phase-locking at low frequencies.

9:28 DISCUSSION

SINONASAL SECTION MODERATOR: MICHAEL G. STEWART, MD*, HOUSTON, TX

9:36 Smoking in Chronic Rhinosinusitis: A Predictor of Poor Long-Term Outcome After Endoscopic Sinus Surgery

Russell D. Briggs, MD+, Galveston, TX
Steven T. Wright, MD, Galveston, TX
Karen H. Calhoun, MD*, Galveston, TX

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the statistically significant factors associated with poor outcomes after endoscopic sinus surgery.

OBJECTIVES: Tobacco smoke is one suggested risk factor for the development and prolongation of rhinosinusitis. Previous studies indicated that smoking at the time of endoscopic sinus surgery (ESS) conferred an increased risk of requiring revision surgery. The purpose of this study was to determine if tobacco smoke exposure at the time of ESS leads to worse outcomes based on a validated and reliable rhinosinusitis specific quality-of-life outcomes test. **STUDY DESIGN:** Retrospective chart review with telephone and letter questionnaire. **METHODS:** The charts of 230 adult patients who underwent ESS for chronic rhinosinusitis between January 1995 and December 1998 were reviewed. A detailed questionnaire was completed that included the sinonasal outcomes test-20 (SNOT-20). The preoperative CT scan of each patient was staged and statistical analysis of the collected data was assessed using a multiple stepwise regression analysis. **RESULTS:** Of the 82 patients who responded, 26 smoked cigarettes and 56 did not. The average SNOT-20 score in the smoking group was 29.8 vs. 19.9 in the nonsmoking group. Statistical analysis comparing SNOT-20 scores and each data field revealed strong correlations with smoking ($p=0.0002$), prior smoking ($p=0.0088$), and antibiotic usage in the prior year ($p<0.0001$). Passive smoke exposure and CT staging scores were not statistically correlated with the SNOT-20. **CONCLUSIONS:** Smoking and prior smoking is associated with statistically worse outcomes after ESS based on SNOT-20 scores. While it is unknown if these effects are reversible, appropriate counseling of smoking patients undergoing ESS for chronic rhinosinusitis should be made in regards to their potential for poor outcomes.

9:44 FESS After Age 60

Joe C. Colclasure, MD+, Charlottesville, VA
Charles W. Gross, MD*, Charlottesville, VA
Stilianos E. Kountakis, MD, PhD, Charlottesville, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the safety of functional endoscopic sinus surgery after age sixty.

OBJECTIVES: Rhinosinusitis is the sixth most common chronic condition of the elderly. Functional endoscopic sinus surgery (FESS) has developed over the last twenty to thirty years into a widely accepted treatment modality for chronic rhinosinusitis in adults who have failed maximal medical management. The aim of this study was to investigate the safety and efficacy of FESS in the geriatric population as compared to that of the adult population. **STUDY DESIGN:** Prospective measurement of outcomes in patients over sixty years of age who underwent FESS. **METHODS:** 56 patients over sixty years of age underwent FESS at the University of Virginia Department of Otolaryngology-HNS and were evaluated preoperatively and postoperatively at three, six, and twelve months with the Sino-Nasal Outcome Test-20 (SNOT-20) questionnaire, the Rhinosinusitis Task Force Symptom Score (RSTFS) questionnaire, and a rigid nasal endoscopy scoring system. Data analysis was performed using the student t-test to compare mean scores. Any complications were noted. **RESULTS:** Patients evaluated by the SNOT-20 scoring system experienced 64% improvement of symptom scores at three months, 73% improvement at six months, and 75% improvement at twelve months. SNOT-20 top five items scores improved 50%, 57%, and 61% at three, six, and twelve months respectively. RSTFS major symptom scores improved 69% at three months, 60% at six months, and 58% at twelve months. RSTFS minor symptom scores improved by 70%, 71%, and 75% at three, six, and twelve months respectively. Rigid nasal endoscopy scores improved by 76% at three months, 65% at six months, and 76% at twelve months. There were very few minor complications and no major complications of the surgery. These results are comparable to those of the literature which address outcomes in the adult population undergoing FESS. **CONCLUSIONS:** FESS in the geriatric population is a safe and effective treatment modality for rhinosinusitis that is refractory to medical therapy.

9:52 Nebulized Betamethasone Therapy for Allergic Fungal Sinusitis

Frederick A. Kuhn, MD*, Savannah, GA
Boris I. Karanfilov, MD, Savannah, GA (Presenter)
Kamran B. Barin, PhD, Columbus, OH

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the positive results of nebulized betamethasone for the treatment of polyp disease in patients with allergic fungal sinusitis.

OBJECTIVES: Report the nebulized betamethasone treatment results on sinus polyps of allergic fungal sinusitis (AFS) patients over a twelve week period. **STUDY DESIGN:** Ten AFS patients were prospectively enrolled in a treatment protocol of twice daily nebulized intranasal betamethasone therapy for twelve weeks. These patients had participated in a previously reported IRB approved 3 week study on nasal mucosal absorption of nebulized betamethasone. Two patients had 5/5 major AFS criteria, seven patients had 4/5 major criteria, and one patient had 3/5 major criteria. **METHODS:** Patient outcomes were determined by photo documented nasal endoscopy throughout the course of the treatment and statistical analysis of Rhinosinusitis Outcomes Measures 31 (RSOM-31) surveys completed by the patients prior to treatment and at the completion of the protocol. Paired t test was performed to compare pre- and post-therapy results. **RESULTS:** Eight patients demonstrated significant improvement, one was equivocal, and one patient's symptoms worsened on therapy. The differences between average RSOM-31 data prior to therapy and post-therapy for all ten patients was statistically significant ($p<0.05$). Archived endoscopic images collected during visits demonstrated clinical improvement and correlated with the RSOM-31 data. **CONCLUSIONS:** Intranasal nebulized betamethasone therapy provides control of symptoms and reduces polyp formation in select patients with AFS. Nebulized betamethasone provides an alternative to systemic steroids and may have a long term role in suppression of polyps.

10:00 The Role of Obesity in Primary Spontaneous CSF Rhinorrhea

Allison L. McCrory, MD, Birmingham, AL
Michael J. Sillers, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the correlation of obesity and primary spontaneous CSF rhinorrhea and its role in diagnosis and management.

OBJECTIVES: Primary spontaneous CSF rhinorrhea (CSFR) refers to idiopathic, normal pressure, non-traumatic CSF leaks. Without significant antecedent history, this disease state can be difficult to diagnose and is associated with significant morbidity and mortality. So, what factors may help raise the level of clinical suspicion for primary spontaneous CSFR? We set to determine if a statistically significant correlation could be made between obesity and the occurrence of primary spontaneous CSFR. **STUDY DESIGN:** Retrospective chart review. **METHODS:** A retrospective chart review was performed on all patients who met the criteria for primary spontaneous CSFR and on an age, gender and racially matched control group. History, age, height, weight, defect and surgical repair were obtained. Body Mass Index [Wt(kg)/Ht²(m²)] was calculated. **RESULTS:** Seventeen patients were found to have primary spontaneous CSFR [mean BMI 33.15 +/- 6.48 vs. 28.20 +/- 5.90 for the control group (p<0.0102)] 72.73% of females and 66.67% of males were found to be clinically obese (BMI ≥ 30). The calculated odds ratio for obesity in a patient with a spontaneous CSF leak was 6.50 (p < 0.01). **CONCLUSIONS:** This is the largest group of primary spontaneous CSFR patients found in the literature. A significant correlation between primary spontaneous CSFR and obesity has been verified. With an increased clinical suspicion when evaluating obese patients with a history suggestive of CSFR we may expedite the diagnosis of a potentially fatal disease condition. Also, as the relationship of these two disease states is further investigated, we may gain better insight into repair failures and explore the role of weight loss in perioperative management.

10:08 Utility of Image Guided Surgery in the Diagnosis of Pterygopalatine Fossa Lesions

Scott P. Stringer, MD, MS, Jackson, MS

Michael S. Aronsohn, MD, Gainesville, FL (*Presenter*)

Heather M. Brown, MD, Gainesville, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate an awareness of the use of image guided surgery in accessing pterygopalatine fossa lesions for biopsy or treatment.

OBJECTIVES: To describe the utility of image guided surgery in the diagnosis of pterygopalatine fossa lesions and to discuss the varied pathologic diagnoses from this area. **STUDY DESIGN:** Case series presentation. **METHODS:** Three cases of pterygopalatine fossa lesions were accessed and biopsied via a middle meatus antrostomy approach into the pterygopalatine fossa under image guidance for rapid localization. **RESULTS:** The diagnoses of melanoma, squamous cell carcinoma, and schwannoma were obtained with minimal morbidity with image guidance. More extensive external approaches were avoided, and appropriate treatment was started without delay. The utility of the image guided approach will be discussed along with the varied pathologies encountered in the pterygopalatine fossa. **CONCLUSIONS:** 1) One must recognize the diverse, yet related symptoms of patients presenting with pterygopalatine fossa lesions. Early recognition as well as skull base imaging is crucial. 2) Biopsy, in addition to imaging, is necessary for diagnosis and may be achieved with little morbidity and increased accuracy using the image guided surgery middle meatus antrostomy approach to the pterygopalatine fossa. 3) The origin of lesions that involve the pterygopalatine fossa may be difficult to identify. Involvement of the pterygopalatine fossa by malignancy may be by contiguous spread, via metastasis, or by perineural invasion.

10:16 DISCUSSION

10:24 Break/Poster Presentations/Visit with Exhibitors - Crystal I - III & Foyer

GENERAL SECTION

MODERATOR: C. RON CANNON, MD, JACKSON, MS

10:55 Analog vs. Digital Photography: Comparison in an Otolaryngology Training Program

Boris I. Karanfilov, MD, Savannah, GA

Leo K. Yin, MD, Columbus, OH

David M. Powell, MD, Columbus, OH

Kamran K. Barin, PhD, Columbus, OH

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to explain the benefits and limitations of various digital cameras as compared to a standard 35-mm camera.

OBJECTIVES: To compare the quality of images generated from a standard 35-mm SLR camera with those from three different digital cameras of varying features and price. **STUDY DESIGN:** A single-blinded prospective independent analysis of four different image categories taken by each of the four cameras. The categories were facial plastics, intraoperative, radiologic, and general landscapes. Nine independent judges evaluated the image sets. These judges included three professional photographers, three otolaryngologists, and three evaluators with no medical or photography experience. **METHODS:** The color accuracy, resolution, contrast, overall quality and rank were evaluated for each image based on an ordinal scale of 1 to 6. One way analysis of variance was performed to test whether the average scores across cameras were significantly (p<0.05) different. Post-hoc analysis was then used to determine differences between cameras. **RESULTS:** The null hypothesis that there is no difference between images taken with the various cameras was rejected (p<0.05) for each of the image attributes. The images produced by the 35-mm analog macro system (Canon A2) and the 35-mm digital macro system (Canon D-30) were not statistically significant. The images produced by the 35-mm analog and digital systems were significantly (p<0.05) better than images produced by the semi-professional (Olympus 3030) and compact (Sony DSC-P1). Differences in rankings of cameras was statistically significant for all cameras for all image attributes. **CONCLUSIONS:** Although the macro systems provide the highest quality images in all categories, the lower priced digital cameras produce excellent images and offer significant cost savings over the macro systems.

11:03 The Role of the Genial Bone Advancement Trephine System (GBAT) in the Multi-Level Surgical Management of Obstructive Sleep Apnea (OSA)

Frank R. Miller, MD, San Antonio, TX

Daniel W. Watson, MD, San Antonio, TX

Mark A. Boseley, MD, San Antonio, TX

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to describe the technique and efficacy of the GBAT system in the multi-level surgical management of OSA.

OBJECTIVES: The GBAT System (Stryker Leibinger Inc.) is a new system for one step isolation and advancement of the genioglossal muscle. This system utilizes a guided trephine to osteotomize the genial tubercle and its adjacent bony structure. Advancement of the tubercle produces secondary advancement

of the tongue and enlargement of the retro-lingual airway space. The purpose of this project is to describe our experience utilizing the GBAT in conjunction with UPPP and hyoid suspension in the multi-level surgical approach to OSA. **STUDY DESIGN:** Retrospective analysis of all patients undergoing UPPP, GBAT, +/- hyoid suspension for the management of OSA. **METHODS:** 1) Series of patients with sleep study documented OSA. 2) No previous surgical management of OSA. 3) Documented multi-level airway obstruction (using cephalometrics and Mueller). 4) Surgical intervention including UPPP, GBAT, +/- hyoid suspension. 5) Comparison pre-operative versus post-operative sleep study and cephalometric parameters. **RESULTS:** Thirty-five patients underwent multi-level upper airway surgery for OSA. The mean age was 44 years with a mean body mass index of 30.6. Pre-operative sleep study data demonstrated a mean RDI of 52.1, low O2 desaturation of 81%, and posterior airway space (PAS) of 7.8 mm. Post-operative sleep data showed a significant improvement with an RDI of 18.0, O2 desaturation to 89%, and PAS of 12.8 mm. The overall surgical cure rate was 73% with cure defined as > 50% reduction in RDI and a final post-operative RDI of less than 20. **CONCLUSIONS:** It is generally accepted that the successful management of OSA requires procedures directed at multiple levels of the airway (retro-palatal and retrolingual). UPPP, as the sole procedure to manage OSA, has been shown to produce an effective cure rate of only 20-40%. The GBAT System provides a self contained system to reliably perform mandibular osteotomies. When performed in conjunction with multi-level upper airway surgery the GBAT can produce reliable surgical cure rates with minimal morbidity.

11:11 Research Subject Privacy Protection in Otolaryngology

Michael C. Noone, MD+, Charleston, SC
K. Christian Walters, BS, Charleston, SC
M. Boyd Gillespie, MD, Charleston, SC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) understand the potential impact of Health Insurance Portability and Accountability Act (HIPAA) regulations on research in otolaryngology, and 2) gain insight into the need to improve documentation of subject privacy protection in the otolaryngology literature.

OBJECTIVES: HIPAA regulations, effective April 14, 2003, will place new constraints on the use of protected health information (PHI) for research purposes. The study reviews current practices of research subject privacy protection in otolaryngology, and suggests changes that will need to be made in order to achieve compliance with HIPAA regulations. **STUDY DESIGN:** Literature review. **METHODS:** Articles appearing in 2001 in The Laryngoscope, Otolaryngology-Head and Neck Surgery, and Archives of Otolaryngology-Head and Neck Surgery were classified according to study design. The methods section of each article was reviewed in order to determine whether the consent and Institutional Review Board (IRB) processes were clearly documented. **RESULTS:** A total of 890 articles were reviewed. Article designs included case series (51%), case report (15%), basic science (15%), expert opinion pieces (8%), prospective cohort (7%), clinical trial (3%), retrospective cohort (0.8%), and meta-analysis (0.4%). Descriptive research involving case reports/case series (66%) were more common than observational studies which utilize a control group (11%). A minority of case series documented the consent (18%) and IRB processes (19%). When case series were compared to observational designs, there was a significant difference in the documentation of both the consent process ($p=0.000$) and the IRB-exemption/approval process ($p=0.000$) with observational studies demonstrating better documentation. **CONCLUSIONS:** Methods used to protect subject privacy are not commonly documented in case series in otolaryngology. Since the case series is the most common research design in otolaryngology, more attention needs to be given to research subject privacy concerns in the otolaryngology literature in order to meet the standards set by other professional journals and in order to achieve compliance with HIPAA regulations.

11:19 Sensitivity of a Screening Skin End-Point Titration Test in Identifying Perennial Only Responsive Patients

Maria C. Veling, MD, Louisville, KY
Michael J. Brown, MD, Louisville, KY (*Presenter*)
Richard Trevino, MD*, San Jose, CA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the value of a Screening Skin End-Point Titration test and discuss its low sensitivity in predicting a patient who is responsive only of perennials.

OBJECTIVES: We have most recently shown that a screening Skin End-Point Titration test is both efficient and sensitive in allergic patients, with values of 96.9% and 96.6%, respectively. This study is to test the sensitivity of a screening SET test in identifying perennial only responsive allergy patients. **STUDY DESIGN:** We performed a retrospective chart of 396 patients, who all underwent a full skin end-point titration panel consisting of 39 allergens. **METHODS:** We obtained 10 allergens (one grass, two weeds, two trees, two molds, and three perennials), which are used in a "screening" SET test in that same region. Sensitivity values were measured on patients identified as perennial only responsive. Prevalence rates of perennial only patients were also figured in this region. **RESULTS:** The sensitivity of a screening SET test, identifying patients as perennials only responsive was 15%. With the addition of molds to our perennial only responsive group, sensitivity rates were still low at 57.5%. In addition, a low prevalence of perennial only responsive individuals on a full panel SET test was identified in this region of the country (64 out of 1000 individuals). **CONCLUSIONS:** The sensitivity of a screening SET test, identifying patients as perennial only is low. If a patient tests positive to any screening allergen, a full panel SET test is necessary to identify all of the patient's allergens and treat them appropriately.

11:27 DISCUSSION

11:35 PANEL: ASK THE SINUS EXPERTS

MODERATOR: James Duncavage, MD*, Nashville, TN
PANELISTS: Roy Casiano, MD*, Miami, FL
Charles W. Gross, MD*, Charlottesville, VA
Brian Matthews, MD, Winston-Salem, NC

12:35 Announcements/Adjourn

6:00 Cocktail Reception - Crystal IV - V

SATURDAY, JANUARY 11, 2003

7:00 - **Registration** - Crystal Foyer
Noon

7:00 - **Business Meeting (Members Only)** - Crystal V
7:50

7:00 - **Continental Breakfast with Exhibitors** - Crystal I - III
7:50

7:00 - **Speaker Ready Room** - To Be Announced
Noon

8:00 - **Scientific Sessions** - Crystal IV
12:35

8:00 **Introduction of Vice President-Elect, Harold C. Pillsbury, MD*, Chapel Hill, NC**
Robert H. Ossoff, DMD, MD*, Nashville, TN

HEAD AND NECK SECTION
MODERATOR: PAUL A. LEVINE, MD*, CHARLOTTESVILLE, VA

8:05 **Endoscopic Neck Surgery: Resection of the Submandibular Gland in a Cadaver Model**
David J. Terris, MD*, Augusta, GA
Brian J. Haus, BS, Stanford, CA
Yamil S. Saenz, DVM, Stanford, CA
Christine G. Gourin, MD, Augusta, GA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the anatomic and endoscopic principles behind the performance of endoscopic submandibular gland resection, and be familiar with the systematic investigations that led to the cadaver applications.

OBJECTIVES: To evaluate the feasibility of performing a totally endoscopic resection of the submandibular gland in a cadaver model. **STUDY DESIGN:** Prospective, non-randomized experimental investigation in a cadaver model. **METHODS:** A modified endoscopic surgical approach (representing a hybrid of balloon dissection and low-pressure carbon dioxide insufflation) previously developed in a porcine model was implemented in fresh cadavers. Once a reliable protocol was achieved, eight procedures were performed in seven cadavers. Data including the operative time, inadvertent neurovascular injury, and size of the glands were prospectively collected. **RESULTS:** All eight endoscopic submandibular gland resections were successfully performed in seven consecutive cadavers (no conversions to open resection were necessary). The length of the procedures ranged from 50 to 150 minutes, with a median of 65.5 minutes, and a steady trend toward a shorter duration. Histologic examination confirmed the presence of normal glandular architecture, without evidence of excessive trauma or thermal injury. The optimal spacing of the instrument ports was 4 cm from the camera port. There were no cases of neurovascular injury. In two cadavers, a minimal amount of subcutaneous emphysema could be appreciated, limited to the skin overlying the dissection. **CONCLUSIONS:** Totally endoscopic resection of the submandibular gland is possible by combining balloon dissection with low-pressure carbon dioxide insufflation. The excellent visualization afforded by the endoscope provided a safe operative approach. A number of endoscopic neck procedures may ultimately be possible, and clinical trials are underway.

8:13 **Sentinel Lymph Node Biopsy (SLNB) in Head and Neck Squamous Cell Carcinoma (HNSCC)**
Karen T. Pitman, MD*, Jackson, MS
Jonas T. Johnson, MD*, Pittsburgh, PA
Manuel A. Brown, MD, Detroit, MI
Eugene N. Myers, MD*, Pittsburgh, PA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the accuracy of SLNB in patients with HNSCC staged N0.

OBJECTIVES: Determine the accuracy of SLNB for staging the regional lymphatics in HNSCC. **STUDY DESIGN:** 1) Feline model for SLNB. 2) Review of patients who received lymphoscintigraphy and gamma probe identification of the SLN during neck dissection. **METHODS:** 1) Felines: Lymphoscintigraphy, gamma probe and blue dye used to determine kinetics of dye and Tc-SC to the SLN of mucosal sites. 2) Retrospective study of 20 N0 patients who received lymphoscintigraphy and identification of SLN during END. Eight patients with palpable neck disease and 5 patients with recurrent disease studied with pre-operative lymphoscintigraphy. **RESULTS:** Felines: Dye and Tc-SC appeared in SLN in <5minutes. Human: SLN identified in 95% (19/20) N0 patients. Average 2.9 SLN's in 2.2 levels. Bilateral SLN in 4/19 patients. SLN accurately predicted pN status when identified. Focal areas tracer uptake observed in 7/8 patients with palpable neck nodes. Collateral lymphatic drainage patterns were depicted by lymphoscintigraphy in previously dissected necks. **CONCLUSIONS:** SLNB is an accurate, minimally invasive method for staging the regional lymphatics in N0 patients. Lymphoscintigraphy may determine levels that require treatment in patients with previously operated cervical lymphatics.

8:21 **Endoscopic Staple Diverticulostomy for Zenker's Diverticulum: Review of Literature and Long-Term Experience in 159 Consecutive Cases**
Christopher Y. Chang, MD, Durham, NC
Rose J. Payyapilli, BS, Durham, NC
Richard L. Scher, MD, Durham, NC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the good outcomes of endoscopic staple diverticulostomy as compared to recent experience (since 1990) in open and other endoscopic approaches to the treatment of Zenker's diverticulum.

OBJECTIVES: Until recently, the most readily accepted treatment for Zenker's diverticulum (ZD) was to perform a diverticulectomy and cricopharyngeal myotomy through a transcervical external incision. However, several reports in the last decade have advocated a minimally invasive technique, endoscopic staple diverticulostomy (ESD), to relieve symptoms related to ZD. However, long-term results and comparisons to recent experience in open and other endoscopic approaches have been lacking in the literature. Here we present long-term follow-up in our experience with ESD. Comparisons of the results obtained

by this approach to other endoscopic and open techniques for treatment of ZD from all the world literature are also presented. **STUDY DESIGN:** Retrospective review of 143 consecutive ESD procedures performed on 135 patients with Zenker's diverticulum between March 1995 and April 2002. Telephone interviews of patients were conducted to assess treatment outcome. Review of literature was performed by Ovid Medline search using keywords "Zenker's diverticulum" for all reports on the surgical treatment of ZD in the English literature since 1990. All referenced journal articles were also obtained not discovered during the initial Medline search. **METHODS:** Patient charts were retrospectively reviewed and information tabulated for age, sex, size of diverticulum, symptoms, duration of symptoms, operative time, length of hospital stay, time before oral intake, complications, and relief of symptoms at first post-operative visit. Follow-up interviews assessed for current status of symptoms and if symptoms returned, how many months after the procedure they recurred. All case series in the English literature since 1990 found in the Ovid Medline database and referenced from identified articles were also tabulated for the same information. **RESULTS:** In the short-term period, 97.5% of patients stated complete or improved symptoms from the procedure. The procedure was unable to be performed in 5.6% of patients. Hospital stay was 0.82 days with a diet started on post-operative day 0.25 on average. There was a 1.4% complication rate without mortality. On review of the literature, patients who underwent ESD had shorter operative times, shorter hospitalization courses, quicker return to diet, lower complication rates, and lower mortality rates compared to open procedures. ESD had comparable mortality rates and time to diet, but fewer complication rates, faster operative times, and shorter hospitalizations compared to other endoscopic procedures (CO2 laser, cautery). Recurrence rates were found to be variable. **CONCLUSIONS:** Overall, ESD is an outpatient procedure with few complications. The technique has a faster operative and convalescence period with fewer complication rates compared with other endoscopic or open transcervical approaches. We advocate that ESD be the initial preferred treatment for ZD.

8:29 Surgical Robots in Otolaryngology: Experience With the DaVinci System

Brian G. Haus, BS, Stanford, CA
David L. Le, MD, Stanford, CA
Yamil S. Saenz, DVM, Stanford, CA
Christine G. Gourin, MD, Augusta, GA
David J. Terris, MD*, Augusta, GA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to be familiar with the technology of surgical robotics, and the potential advantages that they offer, particularly with regard to endoscopic neck surgery.

OBJECTIVES: To explore the feasibility of performing endo-robotic neck surgery in a porcine model and to compare the results of robotically-enhanced endoscopic surgery with those from a conventional endoscopic technique. **STUDY DESIGN:** Prospective, non-randomized experimental investigation in a porcine model. **METHODS:** We performed a consecutive series of endoscopic neck surgeries using the DaVinci Surgical System (Intuitive Surgical, Sunnyvale, CA). The length of time required for establishment of the operative pocket and assembly of the robotic components, and the total duration of each operation was recorded. The animals were continuously monitored for heart rate, blood pressure, and end-tidal CO₂, and evaluation for presence of pneumothorax and subcutaneous emphysema was undertaken postoperatively. The specimens were examined histologically. **RESULTS:** Four different types of neck surgery were successfully performed on both sides of the neck of 4 animals using the DaVinci Surgical System: three submandibular gland resections, three selective neck dissections, one partial parotidectomy, and one thymectomy. No conversions to open resection were necessary. Creation of the operative pocket took an average (\pm s.d) of 18.1 \pm 11.9 minutes and assembly of the robot required 12.5 \pm 9.9 minutes, resulting in a mean setup time for all procedures of 30.6 \pm 21.0 minutes. The mean operative time for submandibular resection was 19.0 \pm 6.6 minutes, with a total procedure time of 39.0 \pm 10.2 minutes. Selective neck dissections required a mean operative time of 66.0 \pm 18.5 minutes and a total procedure time of 85.7 \pm 16.7 minutes. The median estimated blood loss was 0 cc (range 0-10). The end-tidal CO₂ pressure fell from the start to the end of the procedures by a mean of 4.4 \pm 7.9 mmHg. The mean blood pressure fell by a mean of 1.9 \pm 7.5 mmHg. There was one case of modest subcutaneous emphysema, and no cases of pneumothorax or air embolism. **CONCLUSIONS:** Robotically-enhanced endoscopic surgery in the neck is feasible and offers a number of compelling advantages over conventional endoscopic neck surgery. Clinical trials will be necessary to determine if these advantages can be achieved in clinical practice.

8:37 1ST PRIZE - THE LESTER A. BROWN RESIDENT RESEARCH AWARD Expression of p63 in Head and Neck Squamous Cell Carcinoma Cell Lines After Iressa Treatment

Keith E. Matheny, MD+, Nashville, TN
Joseph C. Sniezek, MD, Honolulu, HI
Jennifer A. Pietenpol, PhD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss a potential mechanism of action of Iressa, a promising new chemotherapeutic agent, in the treatment of head and neck squamous cell carcinoma (H&N SCCA).

OBJECTIVES: Both the Epidermal Growth Factor Receptor (EGFR) and p63, a protein overexpressed in the vast majority of H&N SCCA and implicated in their path to carcinogenesis, antagonize apoptosis. Iressa (ZD-1839) is one of several EGFR inhibitors that are currently under evaluation as chemotherapeutic agents in epithelial malignancies. This study was designed to investigate whether p63 expression in H&N SCCA cell lines could be down-regulated by blockade of EGFR by Iressa. Down-regulation of p63 by Iressa would identify a molecular relationship between the two proteins and could explain the mechanism of action of Iressa in the treatment of epithelial malignancies. **STUDY DESIGN:** In vitro examination of p63 expression after Iressa treatment. **METHODS:** Four human H&N SCCA cell lines were treated with Iressa at 1 micromolar. Control, 24, 48, 72, and 96 hour time points were harvested. Western analysis for p63 was then performed. **RESULTS:** Three tumor lines showed marked decline in p63 expression after 24 hours of Iressa treatment. The fourth cell line does not endogenously express p63, therefore no signal was detected at any time point. **CONCLUSIONS:** Iressa down regulates p63 expression in vitro, suggesting a mechanism of action by which EGFR inhibitors have been found to be efficacious in the treatment of epithelial malignancies.

8:45 Immunohistochemical Localization of Interleukin-10 in Human Parotid and Cutaneous Carcinomas

Tarika Bhuta, MD, Morgantown, WV
Christopher H. Rassekh, MD, Morgantown, WV
Barbara S. Ducatman, MD, Morgantown, WV
Susan M. Rodman, EdD, Morgantown, WV

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate that Interleukin-10, an immunosuppressive cytokine, can be localized to human parotid and cutaneous squamous cell carcinoma. This finding could lead to further investigations targeting IL-10 as a factor in carcinogenesis.

OBJECTIVES: Interleukin-10 (IL-10) is an immunosuppressive cytokine that has been localized in several solid tumors including cancers of the lung, nasopharynx, oral cavity, and oropharynx. The objective of this study is to determine whether IL-10 is present in parotid gland tumors and cutaneous squamous cell carcinoma (SCC) of the head and neck. **STUDY DESIGN:** Paraffin embedded archival tissues were retrospectively obtained from 83 patients with parotid gland tumors and cutaneous SCC of the head and neck. **METHODS:** Using a standard immunohistochemical technique, these specimens were stained with a monoclonal antibody to IL-10. The slides were reviewed and given a staining intensity score of 0-4 and the percentage of cells stained was estimated by an exper-

rienced pathologist. **RESULTS:** Evidence of staining for IL-10 was found to be 70.6% (12/17) in parotid SCC, 60.0% (15/25) in cutaneous SCC, 13.0% (3/23) in non-SCC parotid malignancy, and 33.3% (6/18) in pleomorphic adenoma. Prevalence of positive staining for IL-10 was significantly higher in all SCC compared to non SCC specimens ($p<0.001$) and in parotid SCC compared to other parotid malignancies ($p<0.01$). The IL-10 staining consistently localized only to tumor cells. **CONCLUSIONS:** These findings demonstrate that IL-10 can be specifically localized to human parotid and cutaneous squamous cell carcinomas. It also demonstrates the cytokine is localized only to tumor cells. Further studies investigating the role of IL-10 in carcinogenesis are needed. IL-10 may be a future target for research in head and neck tumors.

8:53 Expression of EMMPRIN in Laryngeal Cancer

Eben L. Rosenthal, MD, Birmingham, AL
Satya S. Shreenivas, BA, Birmingham, AL
Andra R. Frost, MD, Birmingham, AL
William E. Grizzle, MD, Birmingham, AL
William R. Carroll, MD, Birmingham, AL
Candece L. Gladson, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the role of EMMPRIN in laryngeal cancer.

OBJECTIVES: A membrane-anchored glycoprotein recently identified on epithelial cells, extracellular matrix metalloproteinase inducer (EMMPRIN), has been shown to induce matrix metalloproteinases (MMPs) by carcinoma-associated fibroblasts. MMPs are known to regulate critical steps in tumor invasion and angiogenesis and the objective of this study is to determine the relative expression of EMMPRIN in laryngeal cancer. **STUDY DESIGN:** Retrospective analysis. **METHODS:** Laryngeal squamous cell carcinoma tumors, normal mucosa (n=4), dysplastic epithelium (n=3) and samples of normal epithelium (n=6) were assessed by immunohistochemical analysis for EMMPRIN expression by two blinded, independent reviews. To determine if protein expression in samples correlated with expression of MMP-2, western blot and gelatin zymography was performed on lysates of tumor and normal epithelium. **RESULTS:** Immunohistochemical analysis of 12 laryngeal tumor samples revealed heavy membrane staining limited to the tumor cells and stronger at the tumor-stromal interface. In normal mucosa and skin EMMPRIN was expressed only at the basal cell layer. EMMPRIN expression in dysplastic epithelium was less than in tumors, but greater than normal epithelium. Analysis of tumor and normal lysates revealed a positive correlation between EMMPRIN and MMP-2 expression. **CONCLUSIONS:** EMMPRIN is highly expressed in cellular membrane of laryngeal squamous cell carcinoma tumor cells, but not in normal mucosa or skin samples. Furthermore, EMMPRIN protein expression correlates with MMP-2 expression. These findings suggest a role for EMMPRIN in the progression of laryngeal cancer.

9:01 DISCUSSION

9:09 Poster Awards Presentation

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

PLASTIC AND RECONSTRUCTIVE SECTION MODERATOR: STEPHEN S. PARK, MD*, CHARLOTTESVILLE, VA

9:12 Laryngotracheal Reconstruction Using a Rigidly Fixated Split Clavicular Myoosseous Flap: A Five Year Review

Lee A. Miller, MD, New Orleans, LA
Paul L. Friedlander, MD, New Orleans, LA
Aldo B. Guerra, MD, New Orleans, LA
Maria T. Messina-Doucet, MD, New Orleans, LA
George D. Lyons, MD*, New Orleans, LA
Stephen E. Metzinger, MD, New Orleans, LA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the role of rigid fixation in patients with laryngotracheal reconstruction.

OBJECTIVES: Previous work from our institution demonstrated that rigid fixation of the larynx and trachea with a split clavicular myoosseous flap yielded excellent short term results for patients with severe laryngotracheal stenosis. In this study, we chose to analyze the long term results of the procedure. **STUDY DESIGN:** Retrospective chart review of twelve patients. **METHODS:** A retrospective chart review was undertaken of twelve patients who underwent laryngotracheal reconstruction from 1997-1999 to evaluate rates of restenosis and overall outcome. **RESULTS:** All twelve patients who underwent laryngotracheal reconstruction using the split clavicular myoosseous flap were decannulated within 8 weeks. All patients remain decannulated with excellent functional status. Two iatrogenic clavicle fractures did occur. **CONCLUSIONS:** In patients with severe laryngotracheal stenosis, the split clavicular myoosseous flap provides a durable means of reconstruction.

9:20 Submental Flap Use in Head and Neck Reconstruction

Stephen W. Bayles, MD, Nashville, TN
James L. Netterville, MD*, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be familiar with the anatomy, harvest technique, variations in flap design, applications, and drawbacks of the submental flap in head and neck reconstruction.

OBJECTIVES: The objective of this study will be to familiarize participants with an infrequently used flap that possesses numerous applications in head and neck reconstruction. We will present a personal experience with this flap outlining variations in flap design, indications and applications. Unique qualities of the flap and pitfalls will be discussed with an attention to patient selection and flap outcomes. **STUDY DESIGN:** Prospective series of patients at a tertiary care referral facility. **METHODS:** A prospective series of 14 patients (7 male, 7 female) with head and neck defects resulting from ablation of head and neck cancer were reconstructed using a submental myocutaneous flap between December 1999—present. The submental flaps were based on the distal submental artery and vein branches of the facial artery and venous systems. All flaps were harvested in conjunction with nodal resection and flap outcomes were recorded. **RESULTS:** Defects reconstructed using the submental flap included: floor of mouth/alveolar ridge 5, base of tongues 3, oral tongues 2, palates 2, and buccal defects 2. Overall flap survival was 86% (12/14) with one partial flap loss and one total flap loss. One patient developed a pharyngocutaneous fistula, which did not affect flap viability and one patient required debulking of the flap for final acceptable functional outcome. Two additional patients were to undergo planned submental flap reconstruction but the reconstructive plan had to be changed due to proximity of tumor to the pedicle. **CONCLUSIONS:** The submental flap has proven to be a very versatile reconstructive tool in the head and neck, particularly for intraoral reconstruction in patients who may not be a can-

didate for free flap reconstruction. The submental flap offers thin, pliable tissue within the operative field that can be transferred without microvascular expertise with minimal donor site morbidity and excellent viability in appropriately selected patients.

9:28 Petrolatum Versus Water-Soluble Topical Preparations Following CO2 Laser Resurfacing

John C. Ferguson, MD+, Tampa, FL
Rebecca T. Carr, BSN, Tampa, FL
John D. Branch, BS, Tampa, FL
Marion B. Ridley, MD, Tampa, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the local wound environment and compare the efficacy of a water-soluble ointment and petrolatum following CO2 laser resurfacing.

OBJECTIVES: There are many different dressing preparations available for cutaneous wounds; often a sign that there is no perfect solution. This study seeks to determine which general class of topical preparations, water-soluble or petrolatum based, provides more rapid wound healing for the partial thickness burn sustained after CO2 laser resurfacing. **STUDY DESIGN:** Prospective evaluation of partial-thickness wounds created with a CO2 laser that are postoperatively treated with either petrolatum-based preparations or water-soluble preparations. **METHODS:** 32 partial thickness burns were made on the back of a female pig; 16 on either side of the midline. Daily application of identical preparations was performed on either side of the midline for the first five postoperative days; however, those on the left had a petrolatum base and those on the right a water-soluble base (K-Y jelly). Daily evaluation of reepithelialization, erythema, infection, and abnormal pigmentation ensued. **RESULTS:** All sites treated with the water-soluble preparations completed reepithelialization prior to the petrolatum-treated wounds. Erythema improved significantly faster on the water-soluble base treated side as compared to the side treated with petrolatum; however, there was no significant difference in the time to complete erythema resolution. There was no instance of infection or pigmentary change. **CONCLUSIONS:** Treatment of partial-thickness burns from CO2 laser resurfacing with a water-soluble topical preparation leads to more rapid reepithelialization and decrease in erythema versus the more common treatment with petrolatum-based products.

9:36 Otoplasty: An Analysis of Technique Over a 33 Year Period

Fred J. Stucker, MD*, Shreveport, LA
Neil M. Vora, MD, Shreveport, LA (*Presenter*)
Timothy S. Lian, MD, Shreveport, LA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to gain insight to otoplasty including application of techniques used in a diverse patient population.

OBJECTIVES: To compare the merits of otoplasty technique to a diverse patient population as experienced spanning a period greater than three decades. **STUDY DESIGN:** A review of a series of otoplasty cases that occurred in two distinctly different clinical settings during a thirty three year period. **METHODS:** A retrospective analysis of 211 patients undergoing otoplasty from 1969 to 1982 in a military hospital setting was compared to 118 patients receiving otoplasty from 1982 to 2002 in a university/private practice setting. **RESULTS:** Otoplasty patients in the military setting were adults, whereas those in the university/private practice setting were children. All those in the military setting required use of lateral conchal cartilage resection combined with a mattress suture technique. In the pediatric population, all patients required use of a mattress suture technique and in selected cases limited lateral conchal cartilage resection was required. **CONCLUSIONS:** Otoplasty technique involving lateral conchal cartilage resection, mattress suture fixation, or a combination of both is applicable to diverse patient populations.

9:44 DISCUSSION

9:52 Break/Poster Presentations/Visit with Exhibitors - Crystal I - III & Foyer

PEDIATRIC SECTION

MODERATOR: AMELIA F. DRAKE, MD*, CHAPEL HILL, NC

10:20 Prospective Comparison of Tonsillectomy Using Electrocautery vs. Harmonic Scalpel

Mitchell B. Austin, MD, Augusta, GA
Scott W. Caveny, MD, PhD, Augusta, GA
Allen P. Butler, MD, Augusta, GA
Edward A. Porubsky, MD, Augusta, GA
Kevin C. McMains, MD, Augusta, GA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be familiar with tonsillectomy using the harmonic scalpel and compare the perioperative and postoperative aspects of this technique in comparison to electrocautery.

OBJECTIVES: To compare the perioperative and postoperative efficacy and safety of tonsillectomy using electrocautery compared to the harmonic scalpel. **STUDY DESIGN:** Experimental, randomized, prospective. **METHODS:** Ninety-eight children between age 2 and 17 with hypertrophic tonsils scheduled for tonsillectomy were randomly assigned to excision using either electrocautery or the harmonic scalpel. Operative time, estimated blood loss, oral intake, hospital stay, postoperative pain medication administration, and readmissions were compared between the two groups. **RESULTS:** Operative time using the harmonic scalpel was on average six minutes longer than using electrocautery. Postoperative oral intake, estimated blood loss, hospital stay, and pain medication usage was not significantly different between the two groups. The electrocautery group had six patients readmitted after surgery for dehydration or bleeding while the harmonic scalpel group had none. **CONCLUSIONS:** Tonsillectomy using the harmonic scalpel was demonstrated to be a safe and effective alternative to electrocautery and was found to have fewer postoperative complications in this study.

10:28 The Efficacy of Polysaccharide Pneumococcal Vaccine (Prevnar) on Prevention of Resistant Pneumococcus in Middle Ear Fluid

Hans E. Caspary, MD+, Norfolk, VA
Craig S. Derkay, MD, Norfolk, VA
David H. Darrow, MD, Norfolk, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the effect of the polysaccharide pneumococcal vaccine on resistant strains of bacteria in children with recurrent and persistent otitis media.

OBJECTIVES: To demonstrate the bacteriology of middle ear effusions retrieved at time of tympanostomy tube insertion in children who have received the

Pprevnar vaccine and compare this to unvaccinated children and historical controls. **STUDY DESIGN:** Prospective review of microbiology results and analysis of patient data sheets. **METHODS:** Children, age 5 months to 17 years, with middle ear effusion present at the time of ventilation tube insertion from July 2001 to July 2002, were included in the study. Middle ear fluid was plated onto culture media after acquisition, and antimicrobial resistance of cultured organisms was examined. Risks factors for antibiotic resistance were determined from the medical history and analyzed. **RESULTS:** Cultures of 439 patient's (716 ears) middle ear fluid were positive for organisms in 40.5%. H influenzae was present in 22.6%, M catarrhalis 9.3%, and S pneumoniae 2.9% of positive cultures. PCN resistance was found in 85% of S pneumoniae cultures. In 120 children that received Pprevnar, PCN resistant S pneumoniae 37.5%, β -Lactamase positive H influenzae 27.5%, and M catarrhalis 27.6% were present. The 161 unvaccinated children, PCN resistant S pneumoniae 50%, β -Lactamase positive H influenzae 26.5% and M catarrhalis 32.7% were present. **CONCLUSIONS:** Compared to historical controls and children not vaccinated, children vaccinated with Pprevnar were infected with resistant pneumococcus 37.5% versus unvaccinated children which had a 50% rate of resistant pneumococcus.

10:36 Adenoideotomy for Pediatric Chronic Sinusitis: Using Computed Tomography of the Sinuses as a Predictor for Success

Brian J. McCool, MD, Morgantown, WV
Hassan H. Ramadan, MD, Morgantown, WV

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the importance of computed tomography of the sinuses in determining the efficacy of adenoideotomy for treating pediatric chronic sinusitis.

OBJECTIVES: To demonstrate the importance of computed tomography of the sinuses in determining the efficacy of adenoideotomy for treating pediatric chronic sinusitis. **STUDY DESIGN:** Retrospective review in a pediatric otolaryngology service in a university setting. **METHODS:** Sixty children with computed tomographic evidence of chronic sinusitis (Lund-McKay scoring system) underwent an adenoideotomy after an allergy evaluation, an immunoglobulin deficiency work-up, and a sweat chloride test were all negative. They also failed at least twenty-six weeks of medical management. Their ages ranged from 21 months to 13 years. Two main outcomes were documented: 1) overall post-operative symptom improvement and, 2) the statistical significance of sex, history of allergy, smoke exposure, asthma, daycare attendance, and CT score on success of the procedure. **RESULTS:** Thirty-three of 60 children (55%) who underwent adenoideotomy had improvement of their symptoms post-operatively. Univariate analysis revealed no statistical significance of sex, history of allergies, smoke exposure, asthma, or daycare attendance on success of procedure. However, 28 of 42 children (67%) with CT scores less than eight had improvement of symptoms, while only 5 of 14 children (27%) with CT scores greater than eight had improvement of symptoms ($p=0.0055$). When all parameters were subjected to multivariate analysis, only CT scores had statistical significance ($p=0.0071$). **CONCLUSIONS:** The current subjective diagnostic criteria for chronic sinusitis has recently been questioned. Our data support the need for CT scanning to objectively document chronic sinusitis and its usefulness in predicting the success of adenoideotomy for treating pediatric chronic sinusitis.

10:44 Inpatient Treatment of Acute Mastoiditis in Children

Steven L. Goudy, MD, Louisville, KY
Alan J. Nissen, MD, Louisville, KY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the treatment and complications of acute mastoiditis.

OBJECTIVES: Define the efficacy of inpatient treatment of acute mastoiditis, the incidence of complications, and if treatment failures were due to antibiotic-resistant organisms. **STUDY DESIGN:** Retrospective chart review of children presenting with acute mastoiditis to evaluate their symptoms, outcome, and complications. **METHODS:** Retrospective chart review of 22 patients admitted from 1998-2001. Each patient's demographic data, pre-admission history, lab and x-ray results, hospital course, and complications were recorded. **RESULTS:** Average age was 4 years. Boys comprised 55%. Average length of symptoms was 4.9 days. Admission length average was 5.6 days. Most frequent symptoms were swelling 63% and pain 55%. Pre-admission antibiotics were given to 50% for an average of 3.3 days. CT scans were obtained in 72%, all revealed in mastoiditis. Five patients had MRIs with venous sinus thrombosis, each presented with symptoms of headache, nausea, vomiting, or cranial nerve palsy. Average WBC was 14.2. Myringotomy was performed in 32% and tympanomastoidectomy in 9%. Cultures were performed in 41%, and one revealed an antibiotic-resistant organism. Antibiotics used included cefuroxime in 68% and clindamycin in 45%. The five patients with venous sinus thrombosis were treated with Coumadin. 50% were discharged home on IV antibiotics. Discharge antibiotics were given for an average of 16.6 days. One patient was readmitted for supra-therapeutic Coumadin levels. **CONCLUSIONS:** Inpatient treatment of pediatric acute mastoiditis with IV antibiotics is effective, infrequently requires operative intervention, and has few complications. A high index of suspicion for intracranial complications of acute mastoiditis is warranted in patients presenting with nausea, vomiting, or cranial nerve palsy.

10:52 DISCUSSION

LARYNGOLOGY SECTION MODERATOR: GAYLE E. WOODSON, MD*, GAINESVILLE, FL

11:00 3RD PRIZE - THE JAMES HARRILL RESIDENT RESEARCH AWARD

Three-Dimensional Reconstruction of Immuno Labeled Neuromuscular Junctions in the Human Thyroarytenoid Muscle

Andrew D. Sheppert, MD+, Morgantown, WV
James D. Garnett, MD, Morgantown, WV
George A. Spirou, PhD, Morgantown, WV
Albert S. Berrebi, PhD, Morgantown, WV

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand and explain the distribution of neuromuscular junctions within the human thyroarytenoid muscle, which may help to direct the use of Botox injections to treat spasmodic dysphonia.

OBJECTIVES: To accurately demonstrate the location of the neuromuscular junctions in a three dimensional construct of the human thyroarytenoid muscle within the true vocal cord. **STUDY DESIGN:** Immunohistochemistry of serially sectioned human true vocal cords followed by reconstruction in three-dimensions with computer imaging software. **METHODS:** Fresh human larynges from autopsy were harvested, fixed in formalin, and imbedded in paraffin. 5 micron serial sections were made at 500 micron intervals throughout the entire vocal cord in an axial plane. Immunohistochemistry was performed with anti-synaptophysin antibody. A computer was used to create a three-dimensional image of the serial sections and therefore locate the clustered band of neuromuscular junctions within each true vocal cord. The vocal cord was divided into thirds from anterior to posterior for statistical analysis. **RESULTS:** In all eight vocal cords studied, the vast majority of the neuromuscular junctions were in the middle third (74%). The fewest neuromuscular junctions were found in the anterior third (7%). This was statistically significant in all 8 specimens ($p < .001$). No significant cluster was found when the 3-D models were studied from medial to lateral or superior to inferior. No difference was seen between male and female distributions. **CONCLUSIONS:** Neuromuscular junction distribution is not random within the human thyroarytenoid muscle. Neuromuscular junctions are most highly concentrated in a band within the middle third. Very few are located within the anterior third. These findings may assist in application of Botox injection in patients suffering from spasmodic dysphonia.

11:08 Open Versus Percutaneous Tracheostomy: A Comparison of Morbidity and Mortality in the Prolonged Ventilation Patient

Henry Frederick Butehorn, III, MD, Albany, NY
Steven M. Parnes, MD*, Albany, NY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to compare the differences between the morbidity and mortality of open tracheostomies and percutaneous tracheostomies. The different mechanisms of the morbidities and mortalities will be discussed.

OBJECTIVES: To compare the intraoperative and postoperative morbidity and mortality for open tracheostomies and percutaneous tracheostomies. **STUDY DESIGN:** Retrospective chart review at a tertiary care teaching hospital. **METHODS:** The charts of adults receiving elective tracheostomies for the indication of prolonged ventilation from January 1, 1999 to December 31, 2000 were reviewed. Intraoperative and postoperative morbidity and mortality for open tracheostomies and percutaneous tracheostomies were compared. **RESULTS:** Of patients undergoing open tracheostomy, 6 percent suffered a complication. There were no intraoperative complications and no tracheostomy related mortalities in the open group. Of patients undergoing percutaneous tracheostomies, 11 percent suffered complications. There were four intraoperative complications and two tracheostomy related deaths in the percutaneous group. **CONCLUSIONS:** Percutaneous tracheostomies have a higher morbidity and mortality rate than open tracheostomies. Major bleeding occurred at similar rates in each group. However, major bleeding in the percutaneous group tended to lead to airway compromise and significant risk of mortality. Airway obstruction occurred at a much higher rate in the percutaneous group. Obstruction occurred from occlusion within the trachea in the percutaneous group while obstruction tended to occur from tracheotomy tube dislodgement in the open tracheotomy group. Intraoperative complications were absent in the open tracheotomy group while two major and two minor intraoperative complications occurred in the percutaneous group.

11:16 Surgical Management of Zenker's Diverticulum: CO2 Laser-Assisted Endoscopic Diverticulotomy Versus Open Diverticulectomy

Chia-Wai D. Chang, MD, Nashville, TN
Brian B. Burkey, MD, Nashville, TN
James L. Netterville, MD*, Nashville, TN
Mark S. Courey, MD*, Nashville, TN
Catherine G. Garrett, MD*, Nashville, TN
Stephen W. Bayles, MD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand anatomic concepts of Zenker's diverticula and the procedure of laser-assisted endoscopic diverticulotomy.

OBJECTIVES: To compare open and CO2 laser-assisted endoscopic surgical management of Zenker's diverticulum. **STUDY DESIGN:** A retrospective review of 49 consecutive surgically treated patients with Zenker's diverticulum was conducted. **METHODS:** Patient's records were reviewed and analyzed for age, sex, size of diverticulum, operative time, length of hospital stay, and complications. A post-operative questionnaire inquiring about swallow function was conducted by mail or telephone. Swallow function was assessed on a 4 point scale. **RESULTS:** Various procedures performed include endoscopic CO2-laser diverticulotomy (n=24) and open diverticulectomy with cricopharyngeal myotomy (n=28). The average operative time of laser endoscopic cases, 85 minutes, was significantly shorter (p<0.001) than that of open diverticulectomy cases, 228 minutes. Length of hospital stay did not significantly vary between the two groups. Four patients (17%) treated by laser endoscopic diverticulotomy demonstrated symptomatic persistent Zenker's diverticulum; 3 underwent re-operation. No open cases required re-operation. One endoscopic case was aborted secondary to esophageal injury from placement of the endoscope. Post-operative fever was seen in 2 (8%) endoscopic cases and 4 (14%) open approach cases. No major complications (recurrent laryngeal nerve paralysis, mediastinitis, death) were encountered. Greater than 90% of respondents from either treatment group reported normal or near normal swallow function. **CONCLUSIONS:** Laser endoscopic management is a reasonable and safe method for surgical treatment of Zenker's diverticulum in comparison with the open technique. Employment of the endoscopic approach reduces operative time and the complexity of post-operative care. Practitioners should be aware that the endoscopic approach may result in a higher failure rate.

11:24 The Role of Transnasal Esophagoscopy (TNE) in Head and Neck Oncology

Gregory N. Postma, MD, Winston-Salem, NC
Kevin K. Bach, MD, San Diego, CA
Peter C. Belafsky, MD, PhD, San Diego, CA
James A. Koufman, MD*, Winston-Salem, NC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand and discuss the diagnostic and therapeutic uses of TNE in the management of head and neck cancer patients.

OBJECTIVES: The emerging technology of transnasal esophagoscopy (TNE) allows the otolaryngologist to perform a wide array of diagnostic and therapeutic procedures in the outpatient clinic without sedation. Its role in head and neck cancer patient management is rapidly evolving. This presentation reviews our current uses of TNE in such individuals. **STUDY DESIGN:** Retrospective review of head and neck cancer patients undergoing diagnostic and therapeutic interventions using transnasal esophagoscopy. **METHODS:** Retrospective review. **RESULTS:** 16 patients underwent TNE followed by standard panendoscopy. 11 biopsies were positive for cancer upon both TNE and operative endoscopy while 5 were negative with both. 2 patients underwent neopharyngeal stricture dilation using Savary dilators 2 patients underwent secondary tracheoesophageal puncture using the transnasal esophagoscope. **CONCLUSIONS:** TNE allows the otolaryngologist to perform a variety of head and neck procedures in the clinic safely and effectively thereby avoiding the cost and potential morbidity of similar surgery in the operating suite.

11:32 DISCUSSION

11:40 PANEL: CHALLENGES IN LARYNGOLOGY

MODERATOR: C. Gaelyn Garrett, MD*, Nashville, TN
PANELISTS: Mark S. Courey, MD*, Nashville, TN
C. Blake Simpson, MD, San Antonio, TX
Stanley M. Shapshay, MD*, Boston, MA
Gerald Berke, MD*, Los Angeles, CA
Gayle E. Woodson, MD*, Gainesville, FL

12:30 Announcements

12:35 Adjourn

POSTERS

1. Cochlear Implantation After Translabyrinthine Acoustic Neuroma Resection

Syed F. Ahsan, MD, Miami, FL
Fred F. Telischi, MD*, Miami, FL
Annelle P. Hodges, PhD, Miami, FL
Tom J. Balkany, MD*, Miami, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the use of cochlear implantation in the auditory rehabilitation of select patients with bilateral acoustic neuroma after translabyrinthine tumor resection.

OBJECTIVES: Patients with Neurofibromatosis-2 (NF-2) can present with bilateral profound sensorineural hearing loss due to bilateral acoustic neuroma. Auditory rehab in these patients can be challenging. We describe a case of simultaneous translabyrinthine acoustic neuroma resection and cochlear implantation in the same ear of a patient with NF-2. **STUDY DESIGN:** A case report and review of the literature. **METHODS:** A prospective chart review of a patient with NF-2 who underwent cochlear implantation and translabyrinthine acoustic neuroma resection in the same ear. **RESULTS:** A 53 year old Hispanic man with NF-2 and bilateral acoustic neuroma with profound hearing loss underwent concurrent translabyrinthine acoustic neuroma resection and cochlear implantation in the same ear. The tumor was situated in the fundus of the IAC with intralabyrinthine extension. Post-operative implant performance with stimulation was in the higher range of that of other cochlear implant recipients. **CONCLUSIONS:** This is the first case, to the best of our knowledge, of simultaneous cochlear implantation and translabyrinthine acoustic neuroma resection in the same ear of a patient with NF-2. In select NF-2 patients cochlear implantation may be considered in their rehabilitation. Even in cases when hearing preservation surgery is not attempted, maintaining anatomic integrity of the auditory nerve can help in subsequent management.

2. Tonsillectomy Complications as a Function of Body Mass Index (BMI)

Eric C. Andrist, MD, Louisville, KY
Julie L. Goldman, MD, Louisville, KY
Daniel J. VanHimbergen, BA, Louisville, KY
Jeffrey M. Bumpous, MD, Louisville, KY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) review the risk factors for complications in tonsillectomy, and 2) discuss the relationship between pediatric tonsillectomy and body mass index (BMI).

OBJECTIVES: To investigate the relationship between BMI and complications after pediatric tonsillectomy. **STUDY DESIGN:** Retrospective chart review. **METHODS:** All patients undergoing tonsillectomy or adenotonsillectomy at Kosair Children's Hospital between January 1998 and March 2002 were included. Three hundred and fifty-three patients were identified and had the necessary information recorded for calculation of their body mass index (BMI). The following information was recorded for each patient: age, sex, height, weight, procedure performed, indication, co-morbidities, and post-operative complications. Each patient's BMI was recorded. The patients were then grouped based on their percentiles into the following groups: Group #1 > 95th percentile (obese), Group #2 85-95th percentile (overweight), Group #3 50-85th percentile, Group #4 25-50th percentile, and Group #5 < 25th percentile. Complications were identified by reviewing peri-operative records and include bleeding, respiratory complications, and dehydration requiring readmission. **RESULTS:** Seventeen complications were identified (4.8%). Eighty-five patients fell into Group #1 (obese), 4 had complications (4.7%). Fifty-five patients fell into Group #2 (overweight), 2 had complications (3.6%). One hundred and eight patients fell into Group #3, 5 had complications (4.6%). Sixty-three patients fell into Group #4, 2 had complications (3.2%). Forty-two patients fell into Group #5, 4 had complications (9.5%). The relative risk for complication as a function of obesity was 0.97, which implies no relationship between obesity and the rate of complication. **CONCLUSIONS:** There is no apparent relationship between obesity and the rate of complication after tonsillectomy. The group that had the highest complication rate were the children whose BMI was < 25th percentile, which may be clinically significant and merits further consideration.

3. Late Outcomes of Tympanoplasty With Nitrous Oxide Anesthesia

Patrick J. Antonelli, MD*, Gainesville, FL
Angela R. Prevatt, BS, Gainesville, FL (*Presenter*)
Timothy E. Morey, MD, Gainesville, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the safety and risks of inhaled nitrous oxide anesthesia for tympanoplasty.

OBJECTIVES: Use of nitrous oxide (N2O) anesthesia has been implicated as a possible cause for tympanoplasty graft displacement or failure, but supporting data is lacking. The purpose of this study was to examine the late outcomes of tympanoplasty performed under N2O anesthesia. **STUDY DESIGN:** Retrospective. **METHODS:** Tympanoplasties performed more than five years previously at an academic, tertiary care facility were retrospectively reviewed. **RESULTS:** Forty-nine consecutive patients with chronic otitis media were treated were reviewed. N2O flow rates ranged 10.07 to 68.18. Tympanic membrane perforations persisted in 5 cases, and revision surgery was required in 2 cases. Outcomes were similar in cases +/- cholesteatoma, +/- ossicular chain reconstruction, or +/- mastoidectomy. **CONCLUSIONS:** Tympanoplasty can be performed with N2O anesthesia with long-term success similar to procedures performed with other anesthetic techniques.

4. The Extended Parascapular Skin Island

Stephen W. Bayles, MD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should have a working knowledge of the subscapular system, with particular attention to the expanded limits of skin harvest on the circumflex scapular vessels.

OBJECTIVES: To review the scapular system of flaps with particular attention to the limit of skin available on the circumflex scapular artery and vein. **STUDY DESIGN:** Case series with case report. **METHODS:** A patient with an extended maxillectomy, orbital exenteration and facial skin resection was reconstructed with an extended parascapular fasciocutaneous free flap. **RESULTS:** The length of the skin island harvested was 42 cm carrying skin overlying the entire distribution of the latissimus dorsi muscle based off the descending branches of the circumflex scapular artery and vein. The distal aspect of the flap was de-epithelialized to provided added soft tissue augmentation of the skull base while the proximal component reconstructed to overlying skin defect. The flap was initially transferred as a pedicled flap to assess the potential arc of rotation. Rotation of the pedicle after division of the lateral scapular bone perforators led to congestion of the flap due to kinking of the pedicle. However after transferring as a free flap with microvascular anastomosis, the distal aspect of the flap was well vascularized and viable. **CONCLUSIONS:** This cases reveals the extended limits inferiorly of the parascapular skin island to be at least to the border of the iliac crest. Lower back skin overlying the latissimus dorsi muscle in this area has often been criticized for its less than reliable nature since it represents

a third angiosome of the thoracodorsal artery and vein when harvested as a musculocutaneous flap. Anatomic study has revealed rich anastomotic networks between the circumflex scapular vessels and the musculocutaneous perforators overlying the latissimus muscle suggesting the possibility of carrying the distal skin of the back based on the circumflex scapular system and this case reveals that to be possible.

5. **Octreotide Scintigraphy in the Head and Neck**

Andres Bustillo, MD, Miami, FL
Fred Telischi, MD*, Miami, FL
Donald Weed, MD, Miami, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to explain the various uses of octreotide scintigraphy in the head and neck.

OBJECTIVES: To describe the uses of octreotide scintigraphy in detecting neuroendocrine tumors of the head and neck. **STUDY DESIGN:** Retrospective chart review. **METHODS:** This study compares the results of octreotide scintigraphy to the histopathologic diagnosis in 61 patients with head and neck neuroendocrine tumors of the head and neck. **RESULTS:** Out of the 53 patients undergoing work up of paraganglioma, 33 were diagnosed with paraganglioma. Octreotide scintigraphy was positive in 31 patients and negative in 17 patients. This yielded a sensitivity of 97% and a specificity of 85%. There were 8 patients in the non-paraganglioma group. Octreotide successfully detected all metastasis in 3 patients with medullary thyroid carcinoma, detected locoregional recurrences in 2 patients with esthesioneuroblastoma, and detected metastasis in 2 patients with Merkel cell carcinoma. It failed to detect a paraspinous metastasis in the third patient with Merkel cell carcinoma. **CONCLUSIONS:** Based on this series of patients, octreotide scintigraphy appears to be a reliable test to detect paragangliomas, and may be helpful in detecting other neuroendocrine tumors.

6. **A Critical Airway: Complete Laryngotracheoesophageal Cleft**

Ajay E. Chitkara, MD, Washington, DC
Monica Tadros, MD, Washington, DC
H. Jeffrey Kim, MD, Washington, DC
Earl H. Harley, MD, Washington, DC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the types of laryngeal clefts, and the complicated management of severe laryngotracheoesophageal clefts.

OBJECTIVES: Laryngotracheoesophageal (LTE) clefts are rare developmental anomalies of the upper aerodigestive tract. They range in severity from being virtually asymptomatic (type I) to being incompatible with life (type IV). The timing of diagnosis is crucial to the successful treatment of severe clefts. Treatment is complicated and requires a multi-team approach. This case report discusses the elements involved in diagnosing and treating this severe airway anomaly. **STUDY DESIGN:** Case report. **METHODS:** Review of a case at a tertiary care center. **RESULTS:** This is a case of a complete laryngotracheoesophageal cleft with left pulmonary agenesis in a newborn. Rigid bronchoscopy revealed a common tracheoesophageal lumen from the larynx to the stomach with a single bronchus supplying the right lung. Management of the patient included establishment and maintenance of a tenuous airway, delivery of nutrition, and anesthetic and surgical planning for upper aerodigestive tract reconstruction. **CONCLUSIONS:** Although severe LTE clefts are rare, they require prompt, team-oriented management for the best possible outcome. The diagnosis, sustenance, and treatment options of these patients depend upon varied and complicated factors which are discussed.

7. **Parapharyngeal Anaplastic Plasmacytoma: Case Report and Review of the Literature**

Diana D. Chuong, MD, Washington, DC
Kenneth A. Newkirk, MD, Washington, DC
Stacy Leatham, MD, Washington, DC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) recognize anaplastic myeloma (AM) as an aggressive plasma cell neoplasm, 2) discuss the different manifestations of multiple myeloma, including extramedullary plasmacytomas and solitary bone plasmacytomas, and 3) explain other clinical prognostic characteristics of AM including LDH levels, beta-2 microglobulin levels, etc.

OBJECTIVES: To present the clinical symptoms of a parapharyngeal mass, the diagnosis of a plasmacytoma, and workup for multiple myeloma. Treatment options and prognosis will be discussed. **STUDY DESIGN:** A case report of a 45-year-old woman with right parapharyngeal mass seen in the otolaryngology clinic at Georgetown University Medical Center. **METHODS:** Discussion of the histopathology, immunohistochemistry, radiographic imaging studies, disease pathogenesis, and treatment as well as prognostic factors. **RESULTS:** Extramedullary plasmacytomas (EMPs) are a solitary mass of plasma-cells found in the soft tissue, most commonly in the oral cavity and upper airway passages. It arises outside of the bone marrow, with 60% found in the nose, nasopharynx, paranasal sinuses and larynx. EMPs can transform to the clinically more aggressive form: anaplastic plasmacytoma (AP), as can the solitary bone plasmacytomas (SBP) and multiple myeloma. Plasmacytomas can present without systemic myeloma. A case of a parapharyngeal anaplastic plasmacytoma resulting in the subsequent diagnosis of anaplastic myeloma in a woman who presented with a right neck mass will be discussed. Diagnosis was made by biopsy and histopathologic examination and immunohistochemical stains of the specimen. A bone marrow biopsy revealed the presence of plasmablasts, demonstrating anaplastic myeloma. Serum protein electrophoresis was performed. Treatment includes chemotherapy and radiation therapy, and prognosis is poor. **CONCLUSIONS:** While extramedullary plasmacytoma is an infrequent manifestation of multiple myeloma, it should be an important differential diagnosis in patients with neck masses.

8. **Primary Localized Amyloidosis of the Nasopharynx**

Diana D. Chuong, MD, Washington, DC
Lin Li, MD, Washington, DC
Earl Harley, MD, Washington, DC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to recognize that amyloidosis should be in the differential diagnosis of a patient presenting with nasal obstruction, unilateral middle ear effusion or intermittent epistaxis. We demonstrate the diagnosis and workup for a patient diagnosed with amyloidosis.

OBJECTIVES: Localized amyloidosis is a rare condition of the head and neck and upper aerodigestive tracts, with only two cases reported in the nasopharynx of children. We describe a case of localized amyloidosis of the nasopharynx in a 14-year-old boy who presented with right ear effusion. Physical examination revealed fluid in the middle ear space, and because of suspicion of a nasopharyngeal mass, a CT scan was done. Diagnosis was made by biopsy and histopathologic examination of the surgical specimen. Systemic amyloidosis was excluded. Treatment is surgical. Localized nasopharyngeal amyloidosis is rare, with only two other reported pediatric cases in the literature. **STUDY DESIGN:** A case report of a 14-year-old boy with unilateral middle ear effusion

seen in the otolaryngology clinic at Georgetown University Medical Center. **METHODS:** Discussion of the histopathology, radiographic imaging studies, and treatment. **RESULTS:** Biopsy is the gold standard for diagnosis. Diagnosis depends on demonstration of amyloid deposits in tissues, with plasma cells and multinucleated giant cells by hematoxylin and eosin stains. Congo Red staining under polarizing light shows an apple-green birefringence. Local disease is treated with surgery and close followup for recurrences. **CONCLUSIONS:** Positive biopsy from an otolaryngologic site showing amyloid necessitates an evaluation for evidence of generalized amyloidosis, plasma cell dyscrasia and other malignancies. While rare, amyloidosis should be considered in the differential diagnosis with symptomatology of nasal obstruction, epistaxis, or persistent middle ear effusion.

9. Management of Advanced, Recurrent Well-Differentiated Thyroid Cancer Involving the Visceral Organs
Francisco J. Civantos, MD, Miami, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the potential palliative role of the judicious combination of radical organ sacrifice and organ preservation in combination with postoperative radiation therapy in the palliation of massive recurrent well differentiated thyroid cancer involving the visceral organs. Thyroid surgeons not involved in management of squamous cell carcinoma should understand when a patient could benefit from referral to a tertiary head and neck service.

OBJECTIVES: Thyroid cancers are usually approached as innocuous tumors with low recurrence rates. However, at a tertiary medical center the surgeon may encounter symptomatic patients who have recurred locally after multiple surgeries and radioactive iodine treatments. These cases may be declared unresectable at a point when judicious application of aggressive surgical procedures of the type commonly applied to squamous cell carcinomas might be beneficial, particularly when combined with external beam radiation therapy. Such surgeries present issues regarding the larynx, trachea, pharynx, esophagus, recurrent laryngeal nerves, and carotid arteries. We wish to present our results in a series of this type of patient, as a reasonable alternative for palliation. **STUDY DESIGN:** Retrospective chart review of thyroid cancer cases over a 10 year period. **METHODS:** Seventeen patients with recurrent well differentiated thyroid cancer who had failed previous surgical treatment in combination with radioactive iodine underwent aggressive surgical management. Surgery required a combination of organ preservation by peeling, partial organ resection, and/or organ, sacrifice, as deemed appropriate, followed by external beam radiation therapy. Data was tabulated regarding swallowing and survival. **RESULTS:** Postoperative radiation therapy proved effective at controlling known microscopic residuals. Fifteen of seventeen experienced remarkably prolonged survival. **CONCLUSIONS:** Patients experienced improved quality of life and longevity that would not have been expected given the dire circumstances in which they presented.

10. Airbags and Restraining Devices: The Effect on Maxillofacial Trauma
Lorri Cobbins, MD, Louisville, KY
Eric J. Lentsch, MD, Louisville, KY
Jeffrey M. Bumpous, MD, Louisville, KY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the Maxillofacial Abbreviated Injury Scale (AIS) and use it to compare severity of injury with the presence or absence of restraining devices.

OBJECTIVES: To evaluate maxillofacial trauma sustained in motor vehicle accidents (MVAs) and correlate the severity of injury with the presence or absence of restraining devices. **STUDY DESIGN:** A retrospective database analysis of patients injured in a MVA and admitted from January 1995 through January 2002 was conducted. **METHODS:** Maxillofacial trauma patients were identified by ICD-9 codes and separated into four groups: unrestrained, seatbelt alone, airbag alone, and airbag with seatbelt. The Maxillofacial Abbreviated Injury Scale (AIS) was used to determine the severity of injury and compared among the four groups. **RESULTS:** 10,633 trauma patients were admitted from 1995 to 2002. 984 patients sustained maxillofacial trauma—729 patients were unrestrained, 195 patients wore seatbelt alone, 16 patients had an airbag deploy, and 44 patients had an airbag deploy and wore a seatbelt. Mean AIS score in the unrestrained group was 1.65, in the seatbelt alone group was 1.40, in the airbag alone group was 1.60, and in the airbag/seatbelt group was 1.20. **CONCLUSIONS:** This study confirms a trend for fewer and less severe injuries in patients using restraining devices. The greatest amount of protection from injury is with the use of an airbag and seatbelt.

11. Histopathologic Analysis of Tonsils in Pediatric Tonsillectomies: A Systems-Based Approach to Changing Standard of Care
Lorri Cobbins, MD, Louisville, KY
Toni M. Ganzel, MD, Louisville, KY
Jeffrey M. Bumpous, MD, Louisville, KY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss his or her standard of care in regards to sending gross and microscopic analysis of pediatric tonsil specimens. Also to demonstrate an understanding of all stake holders involved in histopathologic analysis of these specimens. Participants will also be able to compare the cost of sending specimens for gross and microscopic analysis and review results of those surveyed regarding what standard of care should be.

OBJECTIVES: To evaluate changing trends regarding national standard of care for histopathologic evaluation of pediatric tonsil specimens and to determine local standard of care and identify factors that would drive change. **STUDY DESIGN:** A literature review determining national of care regarding sending pediatric tonsil specimens for histopathologic diagnosis and the incidence of pediatric tonsillar malignancy. A retrospective chart review was conducted on all pediatric tonsillectomy patients with malignancy on histopathologic analysis. **METHODS:** Phone surveys were conducted assessing perspectives among stake holders regarding the value of histopathologic diagnosis. Those surveyed include ENT physicians, pediatric pathologists, hospital administrators, risk management and three major health plan administrators. **RESULTS:** Current national standards include discarding specimens altogether or sending for gross examination only. Our standard is to send all pediatric tonsil specimens for gross and microscopic analysis. Within ten years, 10,000 tonsillectomies were performed at our institution. The incidence of malignancy was 5 in 10,000. Two were unsuspected. The majority of stake holders agree that histopathologic analysis should remain the standard of care. **CONCLUSIONS:** Currently, the national standard regarding sending pediatric tonsil specimens for histopathologic diagnosis is controversial. Likewise, controversy exists locally. While the incidence of malignancy is low, it is not zero, and the delay in diagnosis has impact on patient outcome. Overall cost with regard to total healthcare costs are small; therefore, cost savings do not outweigh the potential negative impact on quality. Thus, our current standard of sending all pediatric tonsil specimens for both gross and microscopic analysis should not be changed.

12. Approach to Hearing Loss Among Primary Care Physicians
Seth M. Cohen, MD, Nashville, TN
Robert F. Labadie, MD, PhD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand how primary care physicians refer for hearing aids and cochlear implants and discuss means of improving outreach and education about cochlear implants to primary care communities.

OBJECTIVES: To investigate audiologic referral patterns of primary care physicians and, more specifically, their referral for hearing aids and cochlear implants.

STUDY DESIGN: Questionnaire. **METHODS:** A random sample of 300 internal medicine, geriatric, and family medicine physicians from the referral basin of a tertiary care center were emailed and/or faxed questionnaires concerning their views about patients with hearing loss in their clinical practices. **RESULTS:** Of 213 physicians receiving a questionnaire, 52 (24.4%) responded. In their communities (94.2% of which were < 50,000 people), 86.5% had available either an otolaryngologist or audiologist, and 28.8% had access to an academic facility. While 96.2% of respondents indicated that hearing loss affected patients' quality of life, only 69.2% of physicians assessed patients for hearing loss. "Lack of time" and "more pressing issues" were the most common reasons given for not evaluating hearing loss. While 46 (88.5%) of physicians were aware of cochlear implants, only 11 (21.2%) have referred patients for implant evaluation. Of these 11, only 6 referred elderly (age > 65) patients. Lack of referral was most commonly due to uncertainties about "where to refer" or about "which patients were potential candidates". **CONCLUSIONS:** The results of this survey indicate that a large percentage of primary care physicians do not routinely test for or treat hearing impairment in adults.

13. Results of Caldwell-Luc After Failed Endoscopic Maxillary Antrostomy in Patients With Chronic Sinusitis

Jeffrey L. Cutler, MD, Nashville, TN
James A. Duncavage, MD*, Nashville, TN
Keith E Matheny, MD, Nashville, TN
Jenny L. Cross, MD, Morgantown, WV
Murat C. Miman, MD, Malatya, Turkey
Charles K. Oh, MD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss current indications for Caldwell-Luc and realize its efficacy in treating patients with chronic sinusitis after failed endoscopic maxillary antrostomy.

OBJECTIVES: The Caldwell-Luc operation (C-L) for treatment of medically refractory chronic maxillary sinusitis has largely been replaced by functional endoscopic sinus surgery. Despite this change, C-L still has well documented indications including treatment of failed endoscopic maxillary antrostomy (MA) and irreversible mucosal changes. The purpose of this study is to review our experience and results of C-L after failed endoscopic MA in patients clinically deemed to have irreversible mucosal changes. **STUDY DESIGN:** Retrospective review of pre and post-operative results of patients who underwent C-L for refractory chronic maxillary sinusitis after failed endoscopic MA. **METHODS:** Pre-operative and post-operative clinical course of patients treated with C-L performed by a single surgeon between 1996 and 2000. Only patients with a history of chronic sinusitis after failed maximal medical therapy, no prior C-L, prior endoscopic MA, and at least 6 months follow-up were included. Outcomes including repeat surgery, documented endoscopic examinations and CT scan results were evaluated to assess treatment success. **RESULTS:** 11 males and 26 females underwent 50 C-L. 13 patients had bilateral C-L performed. The average number of pre-C-L MA was 2.0. 8.0% (n=3) required repeat C-L due to continued sinusitis. 2 of the 3 repeat C-L demonstrated clinical improvement during follow-up. 92.0% of all patient responded to surgical treatment as demonstrated by a normal endoscopic exam or normal CT scan. Average follow-up was 23.5 months. **CONCLUSIONS:** C-L seems to be highly effective in the management of medically refractory chronic sinusitis after failed MA. C-L should remain in the otolaryngologist's surgical repertoire for these selected cases.

14. Extranodal Rosai-Dorfman Disease Presenting as Synchronous Nasal and Intracranial Masses

Kelley M. Dodson, MD, Richmond, VA
Celeste N. Powers, MD, PhD, Richmond, VA
Evan R. Reiter, MD, Richmond, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the clinical presentation and management of extranodal Rosai-Dorfman disease.

OBJECTIVES: To present a rare case of extranodal Rosai-Dorfman disease presenting as synchronous nasal and intracranial masses. **STUDY DESIGN:** Case report. **METHODS:** Retrospective chart review. **RESULTS:** A 56 year old woman with vertex headaches, new onset seizure disorder, nasal obstruction, and hyposmia was found to have a dural based intracranial mass, as well as bilateral masses arising from the inferior turbinates and extending into the nasopharynx. The patient underwent endoscopic resection of the involved portions of the inferior turbinates, including the sizable nasopharyngeal component. Craniotomy was performed at a later date. Both pathologic specimens were consistent with extranodal Rosai-Dorfman disease. The patient demonstrated resolution of all symptoms after surgery. **CONCLUSIONS:** Rosai-Dorfman disease, or sinus histiocytosis with massive lymphadenopathy, is a rare entity usually presenting with cervical nodal disease. When extranodal disease of the head and neck is present, prompt recognition and conservative surgical management is the treatment of choice for this benign pseudo lymphomatous entity.

15. Craniocervical Necrotizing Fasciitis of Odontogenic Origin With Mediastinal Extension

John D. Edwards, MD, Washington, DC
Nader Sadeghi, MD, Washington, DC
Farzad Najam, MD, Washington, DC
Mark Margolis, MD, Washington, DC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate the need for prompt identification of patients with craniocervical fasciitis, recognize physical and radiologic findings, and understand the proper medical and surgical management in these patients.

OBJECTIVES: We review an interesting case of a patient with craniocervical necrotizing fasciitis with thoracic extension and present intraoperative, radiologic, and pathologic findings as well as our management of the patient. **STUDY DESIGN:** Case report. **METHODS:** Retrospective review of all pertinent medical records, operative reports, and diagnostic studies in the case, including computerized tomography scans and pathology specimens. **RESULTS:** Aggressive medical and surgical management in this immunocompetent patient allowed for survival after a prolonged hospital course. Multiple surgical debridements as well as transcervical mediastinal debridement and eventually thoracotomy for mediastinal abscess were required. **CONCLUSIONS:** Craniocervical necrotizing fasciitis is a fulminant soft tissue infection most commonly of odontogenic origin that requires prompt identification and treatment to ensure survival. Broad-spectrum intravenous antibiotics, aggressive wound care and surgical debridement, hyperbaric oxygen and good intensive care are the mainstays of treatment.

16. Auricular Perichondritis and Chondritis: An Institutional Review and Analysis of Ear Piercing Techniques

Patricia A. Gilroy, MD, Danville, PA
W. Edward Wood, MD, Danville, PA
J. Scott Greene, MD, Danville, PA
Brad U. Millman, MD, Philadelphia, PA
Thomas L. Kennedy, MD*, Danville, PA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to recognize the hallmarks of auricular perichondritis and

chondritis, identify the typical bacteriologic causes and appropriate antimicrobial therapy, and recognize appropriate sterilization techniques that should be employed by all ear piercing galleries.

OBJECTIVES: To outline our institution's experience with auricular perichondritis and chondritis, to review the presentation and management of these entities, and to evaluate sterilization techniques that are commonly employed at local ear piercing establishments. **STUDY DESIGN:** A retrospective review of all patients with auricular perichondritis and chondritis presenting at our institution over the past 15 years. We will also perform a questionnaire to several local ear piercing establishments in an attempt to evaluate the effectiveness of their sterilization techniques. **METHODS:** Our institution's database will be searched for all patients presenting with auricular perichondritis and chondritis over the past 15 years. Charts will be reviewed and data will be collected pertaining to patient age, sex, location of ear piercing (helix, tragus, etc.), time to presentation, culture results, antimicrobial therapy and duration, and any surgical debridement. We will also gather information via a questionnaire-style format regarding the site preparation techniques, as well as piercing equipment sterilization techniques of the ear piercing galleries of these patients as well as several local galleries, in an attempt to identify any causative practices. **RESULTS:** We identified 10 patients who presented with auricular perichondritis and chondritis. Causative microorganisms were consistent with the literature and included Staph Aureus and Pseudomonas, with antimicrobial therapy initially covering both organisms and then tailoring according to culture results. Results of the questionnaire are still pending. **CONCLUSIONS:** Auricular chondritis and perichondritis is a potentially disfiguring entity which necessitates prompt recognition and treatment. In certain cases, surgical debridement is necessary. Antimicrobial therapy should cover the most likely organisms until culture results are available. The sterilization techniques of non-physician office ear piercings are likely varied. Strict sterilization techniques should be employed whenever the piercing of cartilage is involved.

17. The Use of Osteoblast-Enhanced Collagen Sponge in the Repair of Critical-Size Defects in Rodent Nasal Bones

Jason S. Hahn, MD, Washington, DC
Sunil Tholpady, BS, Charlottesville, VA
William H. Lindsey, MD*, Washington, DC
Roy C. Ogle, PhD, Charlottesville, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the reconstructive options in the repair of non-healing, critical-sized osseous defects.

OBJECTIVES: Craniofacial defects are common problems faced by the modern otolaryngologist-head and neck surgeon. Type I collagen gels have demonstrated their utility in the repair of critical-sized osseous defects. Likewise, type I collagen sponges have been used by neurosurgeons for the repair of dural defects. Type I collagen sponges are mass-produced and readily available for surgical use. The objective of this study was to evaluate the effect of osteoblast enhancement on type I collagen sponge in the repair of critical-size defect in rodent nasal bones. **STUDY DESIGN:** Randomized, prospective study. **METHODS:** As previously described in the literature, critical size defects were created in the nasal bones of male Sprague-Dawley rats. Collagen sponge alone was used to fill the defect in six animals. Another group of six animals were treated with collagen sponge with 800,000 osteoblasts each. After 30 days, the animals were sacrificed and examined with planimetry, histological staining, and radio-densitometric analysis. **RESULTS:** At necropsy, all specimens had complete coverage of the original critical size defect of the nasal bones with a thin layer of bone. The osteoblast treated group had higher density on gross exam and radio-densitometric analysis ($P=0.0043$). Final histology pending. **CONCLUSIONS:** Type I collagen sponge enhanced with osteoblasts provides a significant improvement in the repair of critical-sized nasal bone defects. This osteoblast-collagen sponge matrix is a valuable approach in the repair of osseous defects and warrants further investigation.

18. Operative Illumination Using White Light Emitting Diodes

Robin S. Horrell, MD, PhD, Louisville, KY
Eric J. Lentsch, MD, Louisville, KY
Jeffery M. Bumpous, MD, Louisville, KY

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to explain how and why light emitting diodes and associated technologies might improve operative illumination.

OBJECTIVES: Assess how the integration of White-Light LED's (wLED), micro-electronics and miniature batteries into lighted surgical instruments might be accomplished. Assess whether operative illumination may be improved using instruments made from these technologies. Ascertain the types of ENT applications where the wLED technology would be best applied. **STUDY DESIGN:** Objective parametric measurements and subjective testing by ENT surgeons. **METHODS:** We focused on the development of several lighted device prototypes, including a lighted wand, tongue blade, "Army-Navy" retractor, and cerumen loop. An objective comparison of the illumination between overhead operating room lights, a headlamp, and prototype retractor was done using a "mock" surgical wound. Prototypes were then tested in the fresh cadaver lab to ascertain their utility in illuminating the oral cavity, a surgical wound, the nares, and external ear canal. **RESULTS:** The comparison between OR lights, headlamp, and wLED's showed the overhead OR light to provide 25-30 times more light, and the head lamp to provide 12-15 times more light to the mock wound under similar angles of incidence. The directly incident light emitted by the LEDs compares in intensity to the overhead lights and headlamp illumination when they are at extreme angles to the subject. The subjective testing in the cadaver lab helps to demonstrate the operative conditions under which each of the prototype devices might be useful. The testing lends insights into how improvements in design might be accomplished. **CONCLUSIONS:** Illuminated surgical instruments can be fabricated inexpensively using wLED's. These instruments are autonomous, i.e. no cables or leads, are ergonomic and non-bulky, and can be designed to have sufficient power to last in lengthy operative cases. Objective and subjective comparison of the wLED devices to the overhead lights/headlamp shows the best utilization of the wLED technology is in confined or shielded spaces where the traditional light sources are of lesser or no value.

19. Repair Methods for CSF Leaks of the Temporal Bone

Karin S. Hotchkiss, MD, Tampa, FL
Loren J. Bartels, MD*, Tampa, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate knowledge of surgical approaches for access to the temporal bone, discuss various repair methods and materials available, and decipher which materials are most beneficial in each repair situation.

OBJECTIVES: To review various surgical approaches and materials available to repair CSF leaks of the temporal bone. An attempt is made to decipher which repair material is most beneficial in each situation. **STUDY DESIGN:** Retrospective chart review in an academic neurootology practice. **METHODS:** Patient charts were reviewed from cases in which a CSF leak of the temporal bone was confirmed at the time of surgery. Location of the leak, surgical approach, repair technique, and recurrence were reviewed. Postoperative use of lumbar drain, hospital stay, and infection rate were compared. **RESULTS:** Nine patients were identified with CSF leak, five female and four male. Surgical approaches included middle fossa and transmastoid. Repair material included use of calvarial bone graft, abdominal fat, conchal cartilage, temporal muscle flap, and synthetic bone source. **CONCLUSIONS:** Multiple approaches and materials are available to repair bony defects of the temporal bone. A thorough working knowledge of these materials enhances the otolaryngologist's ability to successfully repair

temporal bone defects.

20. The Role of Cytomegalovirus in Laryngeal Squamous Cell Carcinoma

Kenneth L. Johnson, MD, Birmingham, AL
J. Scott Magnuson, MD, Birmingham, AL
Eben L. Rosenthal, MD, Birmingham, AL
Charles S. Cobbs, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the role of viruses in carcinogenesis understand the possible role of cytomegalovirus in the development of laryngeal cancers.

OBJECTIVES: The pathogenesis of squamous cell carcinoma (SCCA) of the head and neck is poorly understood. Recent findings in our laboratory have demonstrated that human cytomegalovirus (HCMV) nucleic acids and proteins are present in a variety of tumors, which include but may not be limited to malignant gliomas, prostate carcinoma, carcinoma of the breast, and adenocarcinoma of the colon. HCMV can transform human cells in vitro and can dysregulate pathways leading to malignant transformation. Our goal was to determine the relationship, if any, between HCMV and squamous cell carcinoma of the larynx. **STUDY DESIGN:** Immunohistochemical analysis. **METHODS:** Eighteen archived biopsy specimens of SCCA were analyzed using immunohistochemical techniques. Normal tissue adjacent to tumor specimens served as negative controls. The presence or absence of both early and late cytomegalovirus gene products is described and the patterns of staining are analyzed and discussed. **RESULTS:** HCMV proteins were identified in the epithelial layers of archived tumor specimens, often localizing in the basal cell layer. PCR data to date are supportive of these findings, however protein sequencing is pending. **CONCLUSIONS:** Evidence suggests that HCMV may be present in SCCA of the head and neck. The details of this association, including possible etiologic roles for HCMV in SCCA carcinogenesis, need further elucidation.

21. The Role of Shape-Memory Alloys in Otosclerosis Surgery

Glenn W. Knox, MD, Jacksonville, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to compare shape-memory alloy prostheses with other otologic prostheses in the treatment of otosclerosis.

OBJECTIVES: The aim of this study is to determine the efficacy of a shape-memory alloy, Nitinol, as a component of an improved stapes prosthesis. **STUDY DESIGN:** Prospective laboratory and clinical study to develop a Nitinol stapes prosthesis. **METHODS:** Various diameters of Nitinol wire and temperature transition variants were analyzed with regard to ease of deformation, response to heating, and strength. The size and geometry of the closed hook was determined by measurement of 50 incus cadaver bones. Several heat sources for activating the shape-memory were evaluated, including electrocautery, lasers, and warm water. Trial surgeries were then performed on human temporal bones in the laboratory. The closure characteristics of the Nitinol loop were studied. **RESULTS:** In all cases, a low heat condition was ample to activate the shape memory characteristics of the hook and return it to a closed position after it had been opened. Laser power was generally set well below the power needed for removing bone. The Nitinol loop closed snugly around the incus with application to the top of the hook of a low temperature setting. **CONCLUSIONS:** The Nitinol piston greatly simplifies the stapedectomy procedure by taking the need for a hand operated instrument out of the surgeon's hands. Because of the nature of the Nitinol wire, it can never over-crimp. All these characteristics make the prosthesis advantageous for otosclerosis surgery.

22. Endolymphatic Sac Decompression With Simultaneous Dexamethasone Perfusion of the Middle Ear Space for Intractable Vertigo in Meniere's Disease

Shashidhar Kusuma, MD, Nashville, TN
David S. Haynes, MD, Nashville, TN
Robert F. Labadie, MD, PhD, Nashville, TN
Ashley C. Hardee, MCD CCC-A, Nashville, TN
Laura L. Coleman, MCD CCC-A, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the merits of endolymphatic sac decompression with simultaneous dexamethasone perfusion of the middle ear space as a viable therapeutic option for patients with Meniere's disease suffering from refractory vertigo despite maximal medical therapy, prior to undergoing a destructive procedure such as aminoglycoside perfusion, labyrinthectomy, or a vestibular nerve section.

OBJECTIVES: To investigate if endolymphatic sac decompression with simultaneous middle ear dexamethasone perfusion is beneficial in treating refractory vertigo in patients with Meniere's disease who have failed maximal medical therapy. **STUDY DESIGN:** Retrospective chart review. **METHODS:** A retrospective chart review of the senior author's clinical practice was undertaken to identify patients with Meniere's disease who had persistent vertigo despite maximal medical therapy (consisting of sodium intake restriction, stress and caffeine reduction, diuretic use, vestibular suppressants, and anti-inflammatory agents), and who underwent endolymphatic sac decompression with dexamethasone perfusion. Subsequently, thirty one patients with at least 18 month follow-up were identified. Medical records and/or personal interviews were used to stage vertigo pre and post-operatively using the AAO-HNS, Committee on Hearing and Equilibrium (COHE), reporting guidelines. **RESULTS:** According to the AAO-HNS, COHE reporting guidelines, 35% (11/31) had complete resolution of vertigo following the procedure and were staged as class A. An additional 16% (5/31) had significant improvement in their symptoms and were staged as class B. One patient, 3% (1/31) had class C results, while 16% (5/31), 3% (1/31) and 26% (8/31) of the patients were staged as classes D, E, and F respectively. **CONCLUSIONS:** Endolymphatic sac decompression with simultaneous middle ear dexamethasone perfusion offers a viable option for patients with Meniere's disease who have refractory vertigo despite maximal medical therapy.

23. Cranial Base Resection—An Analysis of 47 Patients

Stephen F. Lee, MD, Little Rock, AR
Ehab Y. Hanna, MD, Little Rock, AR

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the complications associated with cranial base resection as well as compare the latest surgical techniques and reconstructive options available to minimize these complications.

OBJECTIVES: To review one institution's experience with cranial base resection for benign and malignant tumors involving the skull base and analyze results with respect to morbidity and mortality. **STUDY DESIGN:** Retrospective chart review. **METHODS:** The series included 47 consecutive patients age ranging from 15 to 89 years that underwent cranial base resection for benign or malignant tumors involving the skull base. The patients were analyzed with respect to pathology, extent of resection, reconstruction, morbidity, and mortality. Complications were classified as early or late; major or minor; ocular, neurogenic, or other. **RESULTS:** The overall morbidity rate was 64%, and the mortality rate was 2.1%. The most common early complications were diplopia (9 patients) and

transient mental status change (7 patients). The most common late complications were diplopia (6 patients) and middle ear effusion (3 patients). 70% of complications were minor. There was one mortality in the early post-operative period. **CONCLUSIONS:** Cranial base resection is effective for sound oncologic resection of skull base tumors. There is associated high morbidity with acceptably low mortality. Most complications are minor and transient, and attention to meticulous surgical technique can minimize complications.

24. **Voice Analysis of Children With Quiescent Recurrent Respiratory Papillomatosis**

Jonathan P. Lindman, MD, Birmingham, AL
Mark Gibbons, MD, Birmingham, AL
Robin Morlier, MS, Birmingham, AL
Brian Wiatrak, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate an understanding of how the pediatric voice is clinically analyzed. Using several key vocal parameters, the participants should be able to compare the voices of children who have no speech problems with those who have quiescent recurrent respiratory papillomatosis.

OBJECTIVES: The purpose of this study is to compare the vocal function of pediatric patients with quiescent recurrent respiratory papillomatosis (RRP) to normal, healthy children, in order to assess the long-term impact of this disease and its treatment on voice quality. **STUDY DESIGN:** Case-control study. **METHODS:** Four children proven to be in remission for at least 20 months were chosen and compared with age and sex-matched controls. We evaluated the pediatric voice by the following three methods: providing the voice-related quality of life (V-RQOL) questionnaire, obtaining perceptual measures with the GRBAS scale, and performing acoustic analysis. **RESULTS:** Using the V-RQOL questionnaire, each control rated their voice normal (10/50), while our study group scored an average of 11.5/50. Perceptual evaluation characterized the study group's voices to be more hoarse, breathy and rough when compared to controls. The study group had a lower average fundamental frequency (F0), 200 Hz, when compared to controls, at 243 Hz. They also had a higher relative average perturbation (RAP), measuring at 1.10 compared to 0.77. Of note, one child with an RAP of 2.89 had a large impact on raising the average score among the study group. The other cases had normal RAP values. The average maximal phonation times were similar between the 2 groups; 7.8 seconds among the cases and 7.4 seconds among controls. **CONCLUSIONS:** There are objective differences with unknown statistical significance present between the voices of children with quiescent RRP and normal, healthy controls.

25. **Evidence Based Medicine: Use of Computed Tomography Following Nonsurgical Treatment for Advanced Neoplasms of the Upper Aerodigestive Tract**

J. Scott Magnuson, MD, Birmingham, AL
Bruce A. Morgan, PhD, Birmingham, AL
Laura D. Brown, MD, Birmingham, AL
Sharon A. Spencer, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to consider the evidence of the effectiveness of a CT scan in detecting residual or recurrent disease in a patient treated with nonsurgical therapy for upper aerodigestive tract squamous cell carcinoma.

OBJECTIVES: This study evaluates the correlation of computed tomography (CT) with physical exam (PE) and direct laryngoscopy (DL) in detecting residual or recurrent disease in patients who underwent nonsurgical treatment for upper aerodigestive tract squamous cell carcinoma (SCCa). This study also measures the ability of CT to predict post-treatment disease in these same patients. **STUDY DESIGN:** Retrospective review of patient medical records at a tertiary care institution. **METHODS:** Subjects were identified by CPT code and from clinical trial rosters. Only patients who met criteria of nonsurgical treatment, Stage III or IV disease, post-treatment CT scan, and post-treatment DL or PE were included. **RESULTS:** 130 patients were identified and 42 patients met the study criteria. All 42 patients received post-treatment CT and PE. 20 of the 42 patients underwent a post-treatment DL. The overall sensitivity and specificity of post-treatment CT are 50% and 62%, respectively. The false positive and negative rates are 76% and 16%, respectively. The likelihood ratio for a positive CT scan is 1.3 and for a negative CT scan is 0.81, respectively. **CONCLUSIONS:** The results of post-treatment CT do not strongly correlate with DL and PE findings. Moreover, the likelihood ratios of a positive or negative CT scan do not alter the pretest probability of a patient having recurrent or persistent disease. PE and DL remain the best methods for detecting post-treatment residual or recurrent disease. A post-treatment CT scan does not contribute to medical decision making.

26. **Incus Necrosis: Current Management Options**

John T. McElveen, MD*, Raleigh, NC
Paul F. Shea, MD, Memphis, TN (*Presenter*)
Hans P. Zenner, MD, PhD, Tubingen, Germany

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to evaluate the established, as well as the newer techniques for reconstructing the ossicular chain in cases of incus necrosis.

OBJECTIVES: To evaluate the established, as well as the newer techniques for reconstructing the ossicular chain in cases of incus necrosis. **STUDY DESIGN:** Retrospective review of patients who underwent ossicular chain reconstruction due to incus necrosis. **METHODS:** Patients came from a tertiary otologic referral center and had ossicular discontinuity, due to varying degrees of incus necrosis. The incus necrosis was the result of chronic otitis media or prior stapedectomy procedures. Ossicular chain reconstruction was performed using a variety of techniques to compensate for the incus necrosis. These techniques included the use of a variety of incus replacement prostheses, partial ossicular replacement prostheses (PORP), and bone cement. Postoperative audiograms were compared with the preoperative results. **RESULTS:** The hearing results varied with each of the techniques, depending on the presence or absence of the stapes superstructure, and the extent of the incus necrosis. **CONCLUSIONS:** The management of incus necrosis continues to evolve. Optimally, restoration of the ossicular chain by reconstructing the incus provides superior results to bypassing the incus with a PORP. Incus reconstruction can be accomplished with bone cement, or with newer style prostheses that attach to the remnant of the long process and bridge the gap across the necrotic section, either to the stapes superstructure or the footplate.

27. **The Usefulness of Telemedicine in an Academic Otolaryngology Practice**

Brian J. McKinnon, MD, Charlottesville, VA
George T. Hashisaki, MD, Charlottesville, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) explain the application and limitations of telemedicine in an academic otolaryngology practice, and 2) discuss the utilization of telemedicine in other medical fields as compared to otolaryngology.

OBJECTIVES: Telemedicine is a still emerging technology that has become a method to evaluate patients who are either a great distance from, or unable to

travel to, major medical centers. Our university based medical center has had an ongoing telemedicine program since the mid 1990's. This paper's objective is to detail and review the telemedicine experience of an academic otolaryngology department. **STUDY DESIGN:** Retrospective review. **METHODS:** The telemedicine experience at an academic center was examined retrospectively, looking at utilization by comparing the most frequently used services, the frequency of otolaryngologic telemedicine referrals, and the patient population commonly referred to otolaryngology for telemedicine consults. **RESULTS:** Since the telemedicine project was begun, 3,936 consults have been performed, 37 in otolaryngology. The most frequent referrals were in infectious disease, internal medicine, and dermatology. This differs from nation wide findings that show mental health, dermatology, and cardiology referrals were the most frequent telemedicine consults. The majority of otolaryngology patients seen via telemedicine were through the Department of Corrections Telemedicine Project. A significant recurring problem in telemedicine consults was the poor quality of the endoscopic/otoscopic images. **CONCLUSIONS:** While telemedicine consults continue to find roles in the delivery of healthcare, this review suggests that otolaryngology is relatively poorly utilized as compared to other, nonsurgical, medical fields. While the use of telemedicine can be very useful in certain medical fields, at this point, the usefulness of telemedicine in otolaryngology remains limited by such factors as the quality of the images sent during these consults.

28. Outcomes in Sleep Apnea Surgery

Sean M. McWilliams, MD, Birmingham, AL
C. Elliott Morgan, DMD, MD, Birmingham, AL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate the importance of post-operative polysomnography in the management of patients with obstructive sleep apnea. They should also be able to compare the patients' subjective improvement in symptoms with the true objective findings on polysomnography.

OBJECTIVES: To evaluate the efficacy of uvulopalatopharyngoplasty (UP3) with and without concurrent tonsillectomy and nasal septoplasty in the treatment of obstructive sleep apnea (OSA). **STUDY DESIGN:** Retrospective medical chart review and telephone survey. **METHODS:** Retrospective medical chart review of forty-eight patients with polysomnography (PSG) confirmed OSA who underwent surgical correction at our institution from 1999-2001. Telephone survey of patients regarding subjective outcome after surgery. Subjective criteria included snoring, apnea, daytime somnolence, fatigue, and overall subjective improvement. Patients were also questioned about post-operative use of continuous positive airway pressure (CPAP), voice change, dysphagia, and nasal regurgitation. **RESULTS:** Only ten of forty-eight patients (20.8%) had follow-up sleep studies with dramatic improvement in five of ten, moderate improvement in three of ten, and worsening in two of ten. Ninety-three percent had significant improvement in subjective criteria and stated that they would undergo surgery again. 81.5% (39/48) of patients denied the use of post-operative CPAP, although only 12.5% (6/48) underwent follow-up testing documenting resolution of OSA. Greatest improvement was noted after UP3 with tonsillectomy +/- septoplasty. **CONCLUSIONS:** Our study emphasizes that patients who present for surgical evaluation are generally intolerant of CPAP. They wish for a "cure" to avoid CPAP. Most are very satisfied with the outcome of surgery and are lost to follow-up without any objective evidence of resolution of OSA. Therefore, it is imperative that surgeons are vigilant regarding post-operative testing. Our study showed a trend towards greatest improvement after UP3 combined with tonsillectomy, with or without septoplasty.

29. Management of Minor Salivary Gland Neoplasms of the Palate

Brian A. Moore, MD, Nashville, TN
Brian B. Burkey, MD, Nashville, TN
Stephen W. Bayles, MD, Nashville, TN
James L. Netterville, MD*, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to identify the variety of tumors that can arise in the palate, understand the demands of surgical resection in this anatomic region and articulate the options and indications for reconstruction of the resultant surgical defects, including microvascular tissue transfer.

OBJECTIVES: Minor salivary gland tumors are uncommon, accounting for 15% of salivary gland neoplasms; two-thirds occur in the palate. Following surgical extirpation, defects have traditionally been allowed to heal by secondary intention or obturated, with suboptimal aesthetic and functional results. We describe our experience with both benign and malignant tumors of the palatal minor salivary glands, focusing on the limits of adequate resection and functional reconstruction. **STUDY DESIGN:** Retrospective review. **METHODS:** Patient records were reviewed for histopathology, defect size and extent, and method of reconstruction. Length of hospitalization, time to initiation of an oral diet, subjective speech assessment, and complications were examined. **RESULTS:** Since 1989, 42 patients with primary neoplasms originating in the palatal minor salivary glands were treated at our institution. Patients ranged in age from the second to the seventh decades, with a female preponderance. Thirty-six percent of the lesions were benign, and the remainder exhibited an even distribution between adenoid cystic carcinoma, low grade mucoepidermoid carcinoma, and low grade polymorphous adenocarcinoma. Following surgical resection dictated by tumor pathology and evidence of perineural spread, small defects healed by secondary intention. Full-thickness deficits up to 50% of the palatal surface were reconstructed with rotational flaps from the contralateral hard palate, soft palate, or retromolar trigone. Free tissue transfer was employed for more substantial wounds. After 6 months to 12 years of follow-up, there have been no recurrences. **CONCLUSIONS:** Neoplasms of the minor salivary glands in the palate may be effectively excised with margins dictated by the tumor histopathology. Improved functional results may be achieved by reconstructing the resultant defects with rotational or free flaps.

30. Palatal Reconstruction With the Palatal Island Flap

Brian A. Moore, MD, Nashville, TN
Emad Magdy, MD, Alexandria, Egypt
James L. Netterville, MD*, Nashville, TN
Brian B. Burkey, MD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to explain the anatomy, technique, and indications for the palatal island flap in palate reconstruction. They should also express an understanding of the anticipated outcomes and potential complications.

OBJECTIVES: The management of palatal defects resulting from the extirpation of benign and malignant lesions employs a variety of methods, with the optimal techniques allowing maximal postoperative function with minimal morbidity. The palatal island flap is an effective and reliable technique for reconstructing post-ablative oral cavity defects. **STUDY DESIGN:** Retrospective review of medical records. **METHODS:** All patients who underwent palatal resections for benign or malignant lesions at a tertiary care, referral-based head and neck cancer center since 1995 were eligible. Ten patients were identified whose surgical defects were reconstructed with palatal island flaps. The cases were reviewed for the symptomatology, tumor features, defect size, peri- and post-operative management, complications, and impact on palatal function. **RESULTS:** Ten patients, ranging in age from 18 to 81, underwent palatal island mucoperiosteal flaps following resection of a variety of benign and malignant tumors, most arising from minor salivary glands. The defects ranged in size from 4cm² to 15cm², with extension into the floor of the nose in four cases and to the skull base in two. Nine patients were discharged on oral diets, and no patient manifested permanent velopharyngeal insufficiency, speech impairment, or airway compromise. Follow-up ranged from 3 months to 6 years, with an average of 18.5 months. Delayed donor site reepithelialization required debridement in one case, and two patients required obturation of small oronasal fistulae.

CONCLUSIONS: The palatal island mucoperiosteal flap provides an effective means of reconstructing hard and soft palate defects with few complications and low morbidity.

31. Tacrolimus and Mycophenolate Mofetil Provide Effective Immunosuppression in Rat Laryngeal Transplantation

Marc Nelson, MD, Cleveland, OH
Olivia Dan, BS, Cleveland, OH
Sarah Worley, MS, Cleveland, OH
Marshall Strome, MD*, Cleveland, OH

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the current methods of immunosuppression in laryngeal transplantation.

OBJECTIVES: Tacrolimus (T) is efficacious in several transplantation settings. Some studies demonstrate improved results using combination therapy with mycophenolate mofetil (M). Our primary objective was to evaluate the efficacy and optimal dosing of tacrolimus in preventing rejection, utilizing an established rat model of laryngeal transplantation. Secondly, the ability of mycophenolate to allow lower dosing of tacrolimus while achieving equivalent immunosuppression was investigated. **STUDY DESIGN:** Dosage groups (mg/kg) were 0.1T, 0.2T, 0.3T, 0.6T, 0.1T15M, 0.1T30M, 0.1T40M, 0.2T15M, 0.2T30M (30 day only) and 0.2T40M. Each group contained 8-10 rats. **METHODS:** Grafts were harvested for histologic analysis on day 15 or day 30 post-transplant. Histopathology of the graft was blindly graded according to an established scale. Dosage groups were compared on rejection score using the Wilcoxon Rank Sum test and the Jonckheere-Terpstra test for trend. **RESULTS:** There was a significant association between increasing dose of tacrolimus alone and decreasing rejection score at both 15 and 30 days ($P < 0.001$). In the groups treated with 0.1T, an increasing dose of mycophenolate was associated with lower rejection scores at both 15 and 30 days ($P = 0.001$). In the group treated with 0.2T, there was no evidence that the addition of mycophenolate resulted in lower rejection at 15 days. However, at 30 days, combination therapy with increasing doses of mycophenolate was associated with decreasing rejection score ($P = 0.002$). **CONCLUSIONS:** Tacrolimus is an effective immunosuppressive agent for laryngeal transplantation. Mycophenolate mofetil allows lower doses of tacrolimus to be utilized while preserving graft viability in the early post-transplant period.

32. The EXIT Procedure in Management of Congenital Skull Base Teratoma

Chau T. Nguyen, MD, Tampa, FL
Peter W. Orobello, MD, St. Petersburg, FL

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to 1) discuss the etiology and features of congenital teratomas, and 2) understand and explain the EXIT procedure in their management.

OBJECTIVES: We present one model of a coordinated team approach in managing an infant with an antenatally diagnosed massive skull base tumor. With sensitive ultrasound technology detecting more head and neck masses prenatally, the need for rapid and effective management of potential airway complications from such lesions during delivery grows. **STUDY DESIGN:** A case report and review of the literature. **METHODS:** A retrospective chart review. A 27-year old Hispanic female, gravida 3 para 2 with full prenatal care was noted on routine ultrasound at 23 weeks of gestation to have a fetus with what was initially described as a large facial mass. At 37 weeks of gestation, an MRI of the fetus was done revealing a 4 cm cystic mass in the left neck, tongue, and face; extending to or originating from the cranial base. **RESULTS:** A surgical team was assembled in preparation for delivery at 38 weeks of gestation consisting of an obstetrician, pediatric otolaryngologist, anesthesiologist, neonatologist, and experienced pediatric OR staff. In December of 2001, a baby boy was delivered via the EXIT (ex utero intrapartum) procedure, weighing 3840 grams. The pathologic report showed a mature cystic teratoma. **CONCLUSIONS:** Teratomas are uncommon neoplasms. They may impinge on the infant airway. Prenatal recognition is thus essential to ensure proper management of these tumors. In this case, the EXIT procedure was carried out. The survival rate utilizing this method has been reported as high as 85%. It is the procedure of choice when confronted with the need to secure the fetal/neonatal airway.

33. Hospital Utilization in the Treatment of Sleep Apnea

Erik J. Petersen, BS, Richmond, VA
Evan R. Reiter, MD, Richmond, VA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the current status of inpatient hospital utilization in the management of sleep apnea.

OBJECTIVES: To evaluate current inpatient hospital utilization for treatment of sleep apnea. **STUDY DESIGN:** Retrospective review of database. **METHODS:** The 1999 Nation Inpatient Sample, a database representing 7.2 million inpatient hospital stays, was searched for admissions under the primary diagnosis of sleep apnea. Records were examined to determine demographics, comorbidities, procedures, complications, length of stay, and charges. **RESULTS:** There were 2,120 (0.03% total sample) admissions for sleep apnea. Average patient age was 41.5 years, 72.4% were male, 68.8% were Caucasian and 19.2% African-American. The most common medical comorbidities were: hypertension (25.2%), obesity (23.6%), congestive heart failure (10.1%), diabetes (9.6%), esophageal reflux (6.7%), and asthma (6.0%). Procedures were performed during 77.9% of patient admissions for sleep apnea. Of those patients having any procedures performed, the average number of procedures was 2.9, with the most common being palatoplasty (78.0%), tonsillectomy (34.0%), turbinate reduction (17.1%), septoplasty (15.3%). Less frequent procedures included tracheotomy (6.9%), CPAP (4.9%), and tongue procedures (3.5%). Complications, including hemorrhage (4.8%), acute airway obstruction (1.7%), were rare. Mean length of stay was 3.17 days, and total charges per admission averaged \$10,379.34. **CONCLUSIONS:** Hospital utilization for sleep apnea remains largely for the surgical treatment of the disease. Multiple procedures are often performed, with low rates of complication. While procedures directed at nasal and pharyngeal obstruction are common, hypopharyngeal obstruction is seldom addressed.

34. Vocal Fold Granulomas: Botulinum Toxin May Be First Line of Treatment

Joanne Pham, MD, Shreveport, LA
Sheng G. Yin, MD, Shreveport, LA
Mathew Morgan, Shreveport, LA
Fred J. Stucker, MD*, Shreveport, LA
Cherie-Ann O. Nathan, MD*, Shreveport, LA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss an alternative treatment for laryngeal granulomas.

OBJECTIVES: The surgical management of vocal fold (VF) granulomas is challenging with 20-60% recurrence rates. We wanted to determine response rates of the granulomas to botulinum toxin alone. **STUDY DESIGN:** In the last two-year five patients were referred to us with recurrent VF granulomas having failed multiple surgical excisions, along with speech and anti-reflux therapy. We performed a prospective analysis on the outcome of patients treated with Botox alone. **METHODS:** The following factors were assessed to determine response to treatment with Botox: etiology, prior treatment and size of the granulomas.

15-20 units of Botox type A were injected to the ipsilateral thyroarytenoideus under EMG guidance. Video stroboscopy was used to assess the response to Botox. **RESULTS:** Two patients had acid reflux and three had idiopathic causes. All granulomas were of a significant size and one was almost obstructing. Four/five patients' granulomas resolved two to six weeks after the injection. The patient with the obstructing granuloma did not resolve and subsequent surgical excision was consistent with pyogenic granuloma. He recurred again two weeks after surgery similar in size to the other granulomas in the study and this responded completely to Botox alone. At the present time follow up ranging from two months to two years shows no recurrences. **CONCLUSIONS:** Botox alone was successful in treatment of significantly large recurrent laryngeal granulomas. The results in terms of recurrence, risk and cost of the procedure with Botox alone are significantly less than surgical management. Botulinum toxin should be considered as first line therapy.

35. Endoscopic Management of Complex Frontal Sinus Mucocoeles: A Safe Approach With Image Guidance

Clifford H. Rice, Jr., MD, Shreveport, LA
Fred J. Stucker, MD*, Shreveport, LA
Cherie Ann Nathan, MD*, Shreveport, LA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the advantage of using image guidance in the management of frontal sinus mucocoeles.

OBJECTIVES: Traditional management for frontal sinus mucocoeles has been complete removal of the mucocoele with obliteration or ablation of the sinus. With the advent of endoscopic sinus instrumentation, endoscopic decompression appears to be a safe and less morbid alternative. However, as the etiology of frontal sinus mucocoeles generally involves complex anatomical abnormalities the endoscopic approach has not become standard of care. Hence, we wanted to investigate the use of image guidance in the endoscopic management of frontal sinus mucocoeles. **STUDY DESIGN:** Image guidance was used for the endoscopic management of complicated frontal sinus mucocoeles. **METHODS:** Three patients with frontal sinus mucocoeles were evaluated. Each patient underwent preoperative evaluation including nasal endoscopy, a VTI computed tomography scan and MRI to determine extent of intracranial and orbital extension, followed by endoscopic decompression of the mucocoele using the Instatrak guidance system. A pediatric endotracheal tube was then placed to serve as a nasofrontal duct stent. Routine follow up with repeated endoscopy and computed tomography scans have been performed. **RESULTS:** All three patients had successful decompression of the frontal sinus mucocoeles. There were no complications, and each patient experienced complete resolution of their symptoms. Follow-up CT scans showed resolution of orbital displacement and endoscopic examination shows no evidence of recurrence. **CONCLUSIONS:** The image guidance system allows for a safe and effective means of decompressing complicated frontal sinus mucocoeles. In the past this approach was not proposed as the procedure of choice for every otolaryngologist. The use of image guidance makes it a relatively safe procedure and should be considered the first line of treatment for this disease.

36. Silent fMRI of Tonotopicity and Stimulus Intensity Coding in Primary Auditory Cortex

Peter S. Roland, MD*, Dallas, TX
Zerrin F. Yetkin, MD, Dallas, TX

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to interpret functional MR images of primary auditory cortex activation evoked by pure-tone stimulus.

OBJECTIVES: With the advent of the silent functional MRI (fMRI), auditory cortex (AC) activation can be evaluated without the confounding effects of scanner noise. The aims of this study were to determine the feasibility of obtaining the primary AC activation evoked by puretones presented at hearing levels, to evaluate tonotopicity in the primary AC, and to determine the effect of stimulus intensity in primary AC activation using silent fMRI. **STUDY DESIGN:** A prospective functional magnetic resonance imaging study of auditory cortex activation. **METHODS:** Six young adults with normal-hearing underwent silent fMRI. An audiometer was used to deliver pure-tones of 1000, 2000 and 4000 Hz to the left ear. Two intensity levels of stimulus were delivered: 1-Threshold stimulus: hearing levels determined in the scanner room 2-Suprathreshold stimulus: 70dB (HL). Tonotopicity and stimulus intensity coding was assessed based on the location, extent, and amount of the activation. **RESULTS:** The localization of activation moved to more medial and posterior regions of the primary AC as the frequency of the pure-tone increased. Compared to threshold stimulus, suprathreshold stimulus evoked the same regions with increased spatial extent. Average increase in the right primary AC activation in response to suprathreshold stimulus was 57% in 1000Hz, 51% in 2000Hz and 45 % in 4000Hz compared to that of threshold stimulus. **CONCLUSIONS:** Silent fMRI can be used to evaluate tonotopic organization of the primary AC. Primary AC activation increases in response to increased level of stimulus intensity in majority of studied young adults. The utility of silent fMRI in the evaluation of primary AC activation in hearing impaired merits investigation.

37. A Novel Approach to Invasive Fungal Sinusitis—Use of Adjuvant Topical and Nebulized Amphotericin B

Ari B. Rubinfeld, MD, Bethesda, MD
Bradly D. Clark, MD, Richmond, VA
Raymond Candage, BS, Toledo, OH
Erik S. Kass, MD, Bethesda, MD

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the utility of topical and nebulized amphotericin B as adjuvants to the standard of care of invasive fungal sinusitis.

OBJECTIVES: The objective of this case report is to examine the benefits of topical and high pressure, high concentration nebulized amphotericin B as adjuvants to the standard of care for invasive fungal sinusitis. **STUDY DESIGN:** This is a two patient case presentation of a treatment protocol for invasive fungal sinusitis introduced by a staff otolaryngologist at the National Institutes of Health. **METHODS:** The charts of two patients who presented to the otolaryngology service at the NIH were retrospectively reviewed to assemble the current case presentations. Both patients had pathologically confirmed invasive fungal sinusitis. Standard management was instituted and included treatment of underlying metabolic or systemic disturbances, antifungal therapy, and surgical debridement. Both patients were monitored endoscopically following surgical debridement, and they underwent mucosal atomization treatments with high pressure (60 psi) amphotericin B rinses and daily nebulized amphotericin B at a high concentration (1 mg/mL). In one case, topical amphotericin B was effectively employed for a recurrent fungal lesion. **RESULTS:** Both patients were disease free two and a half years following treatment. One patient's eye was at risk due to recurrent disease, but was subsequently spared following high concentration topical amphotericin B. **CONCLUSIONS:** Topical and long term, high pressure nebulized amphotericin B administered at high concentration appear to be viable additions to the current standard of care in the treatment and prevention of invasive fungal sinusitis.

38. Anhydrous Ammonia Burn: An Acute Inhalational Injury Resulting In Long-Term Impairment

Kirby J. Scott, DO, Portsmouth, VA
Ronald C. Hamaker, MD*, Indianapolis, IN
Darren Kest, DO, Indianapolis, IN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to diagnose inhalational anhydrous ammonia chemical injuries, anticipate both acute and long term sequelae of inhalational injuries, and effectively manage inhalational anhydrous ammonia chemical burn injuries.

OBJECTIVES: Chemical burn injuries are associated with significant morbidity and account for a small number of burn unit cases. Inhalational chemical injuries pose a special problem involving the diversity of chemical exposures (time of exposure, concentration of chemical), the resulting complications, and the long-term respiratory sequelae of the burns. Inadvertent inhalation of anhydrous ammonia, the most widely used fertilizer in the United States, is a relatively common cause of inhalational chemical injury, caused by a colorless, pungent gas that is stored under pressure in a liquid form. **STUDY DESIGN:** In addition to skin and eye injury, inhalational injury of anhydrous ammonia usually occurs accidentally during the manufacture of fertilizers, pesticides, plastics or explosives. Acute tracheobronchitis often routinely leads to long term, potentially fatal, impairment of respiratory function. Mechanism of injury, presenting symptoms, and treatment options are compared. **METHODS:** A case of industrial strength anhydrous ammonia exposure is presented, including the management of acute and long-term disease processes. **RESULTS:** With a high index of suspicion, and an understanding of the pathophysiology leading to morbidity, ventilatory impairment can be anticipated and imminently addressed. **CONCLUSIONS:** Adequate education regarding the caustic nature of anhydrous ammonia, aggressive initial management, and an understanding of the long term sequelae of inhalational injuries can prevent an increase in the frequency of this serious, potentially lethal, chemical injury.

39. Correlation Between Facial Pain or Headache in Rhinosinusitis Patients in Canadian and US Subjects

Gordon A. Shields, MD, Galveston, TX
Hadi Seikaly, MD, Edmonton, AB Canada
Matthew H. LeBoeuf, BA, Galveston, TX
Faustino C. Guinto, MD, Galveston, TX
Herve J. Leboeuf, MD, Manchester, NH
Karen H. Calhoun, MD*, Galveston, TX

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to explain that facial pain and headache in rhinosinusitis are not good predictors of severity of disease on CT scan. Participants should also be able to discuss the difference found between Canadian and U.S. patients in pain perception.

OBJECTIVES: 1) To determine whether a correlation exists between facial pain or headache and sinus disease severity by computed tomography scan in rhinosinusitis patients, and 2) to compare disease severity and pain perception in two geographically diverse North American populations. **STUDY DESIGN:** Prospective patient questionnaire prior to computed tomography of the paranasal sinuses. **METHODS:** Patients with refractory rhinosinusitis were recruited at a university hospital in the U.S. and a university hospital in Canada. Prior to computed tomography scanning patients completed a pain questionnaire. All scans were interpreted by one neuroradiologist and were scored using the Lund-McKay, Harvard, and Kennedy staging systems for rhinosinusitis. **RESULTS:** Fifty-one patients completed questionnaires (27 were Canadian). There was no correlation between pain severity and disease severity reflected by any of the three staging systems used ($p > .05$). The mean pain score for the U.S. patients 7.3, and for Canadian patients, 5.2. The mean CT scores for the U.S. vs. Canadian patients were: Lund-McKay 2.6 vs. 6.6, Harvard 0.7 vs. 1.0, Kennedy 1.4 vs. 2.2. The Canadian patients had more severe disease on CT scan (Lund-McKay: $p = .001$, Harvard $p = .005$, Kennedy $p = .007$) while reporting less pain ($p = .004$). **CONCLUSIONS:** There was no correlation between pain severity and disease severity by sinus computed tomography as graded by the Lund-McKay, Harvard, or Kennedy staging systems. Facial pain and headache, although frequent complaints of rhinosinusitis patients, are not useful predictors of sinus disease severity. There appears to be a difference in pain perception between the two North American populations.

40. Oncocytic Cyst of the Larynx Causing Dysphonia

John T. Sinacori, MD, Nashville, TN
Jonathan Workman, MD, Nashville, TN
Alex Filatov, MD, Nashville, TN
Robert H. Ossoff, DMD, MD*, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to understand the etiopathological causes of oncocytic cysts and the surgical management utilizing microlaryngeal techniques and the carbon dioxide laser.

OBJECTIVES: Oncocytic cysts of the larynx are rare benign lesions that can cause significant dysphonia, airway obstruction, and dysphagia. The objective is to familiarize the clinician with this entity and propose a cause for its formation. **STUDY DESIGN:** Retrospective case study and literature review. **METHODS:** Published reports of oncocytic cysts of the larynx were reviewed in conjunction with one case presenting at our institution. **RESULTS:** Oncocytic metaplasia of the salivary glands increases with age. Laryngeal cysts of the larynx can form secondary to seromucinous gland obstruction and maybe lined with oncocytes. Without a lining comprised solely of oncocytes, the pathologist may not call it an oncocytic lesion. **CONCLUSIONS:** Surgical management involves removal of the cyst wall under microlaryngeal techniques. The carbon dioxide laser is an excellent adjunctive tool for complete extirpation of and oncocytic cyst. Seromucinous gland obstruction appears to be the inciting event causing the formation of laryngeal cysts and oncocytic metaplasia may be a coincidental finding. Thorough follow-up is recommended because of the tendency for these cysts to recur.

41. Inter-Observer Variability in Judging Insertion Depth from Plain Radiographs of Med-El Cochlear Implant

N. Wendell Todd, MD*, Atlanta, GA
Turner I. Ball, MD, Atlanta, GA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the limitations of plain radiographs in assessing the degree of insertion of cochlear implant electrodes.

OBJECTIVES: To describe the inter-observer agreements of experienced United States MED-EL cochlear implant surgeons in judging the extent of cochlear electrode insertion as depicted in plain radiographs of varying angular precision relative to the Stenvers orientation. **STUDY DESIGN:** Five otologists, unaware of the image formulations, judged insertion depth. **METHODS:** In a bequeathed cranial base specimen, who had no history of ear disease, a cochleostomy was done from the exposure afforded by a trans-cortical mastoidectomy with facial recess opening. A standard MED-EL Combi 40+ electrode was inserted 3mm less than fully, and stabilized. The specimen was positioned in the Frankfort horizontal plane with a custom cephalostat. Plain radiographs were made in six projections relative to Stenvers. Then, after the electrode array was withdrawn 5mm and stabilized, six more plain radiographs were similarly taken. **RESULTS:** In the Stenvers projection, the assessed degree of coiling ranged from 270 to 450 degrees (mean 378), and from 270 to 54 degrees (mean 360) in the two insertion conditions, respectively. Similar variability was noted at angular orientations away from Stenvers. **CONCLUSIONS:** The wide inter-observer range of degree of coiling indicates that plain radiographs are of little use in assessing insertion depth of the MED-EL Combi 40+ electrode. This conclusion can probably be generalized to other manufacturer's implants.

42. Outcome Analysis of Patients Admitted to the Intensive Care Unit After Major Head and Neck Surgery

Christopher G. Trahan, MD, New Orleans, LA
Christian A. Hall, MD, New Orleans, LA
Christy L. Delaune, BS, New Orleans, LA
Jeremy P. Watkins, BS, New Orleans, LA
Dawn B. Sharp, BS, New Orleans, LA
Paul L. Friedlander, MD, New Orleans, LA

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss predictive factors and impact of complications in patients who have been admitted to the intensive care unit (ICU) after major otolaryngological procedures.

OBJECTIVES: To determine the prevalence, outcome and predictive factors for complications in patients who undergo major otolaryngology procedures. **STUDY DESIGN:** Retrospective, consecutive chart review. **METHODS:** Two hundred and seventy one patients were identified who were admitted to the ICU after undergoing major otolaryngological surgery from 1997- 2000. The patients' charts were retrospectively reviewed to determine the frequency and presence of complications. Outcome was determined through analysis of hospital and ICU length of stay as well as need for re-admission to the ICU. Age, ASA, and Charlson scores were determined and analyzed as predictive factors for complications in this population. **RESULTS:** One-hundred and ninety seven patients (73%) had no complications, forty-eight patients (18%) had medical complications, fourteen patients (5%) had surgical complications and eleven patients (4%) had both medical and surgical complications. The presence of medical complications translated into increased number of ICU days, surgical complications translated into a greater overall length of stay in the hospital, and both complications translated into a greater frequency of readmission to the ICU ($p < .001$). Charlson score was predictive of medical complication and was non-informative for surgical complications ($p < .05$). ASA and age were not predictive of either medical or surgical complications ($p < .05$). **CONCLUSIONS:** Patients undergoing major otolaryngological surgery are at an increased risk for medical versus surgical complications in the post-operative period. Pre-operative assessment including the Charlson score may prove to be beneficial in identifying patients who are at risk.

43. Sphenoid Sinus Myxoma: A Case Report and Literature Review

Todd Wine, BS, Nashville, TN
Brian A. Moore, MD, Nashville, TN (*Presenter*)
Brian B. Burkey, MD, Nashville, TN

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to describe the characteristics of myxomas of the head and neck and discuss the surgical options for the management of isolated sphenoid sinus disease.

OBJECTIVES: Myxomas are benign connective tissue neoplasms that occur in the atria, as well as in bone, skin, subcutaneous tissue, and skeletal muscle. Myxomas of the head and neck are rare neoplasms, and they typically arise from the mandible or maxilla. Fewer than 30 cases of sinonasal myxomas have been described in the English language literature. We present the first case of a sphenoid sinus myxoma and describe its presentation, characteristics, and treatment options, focusing on strategies for managing isolated lesions of the sphenoid sinus. **STUDY DESIGN:** Case report and review of the literature. **METHODS:** We present the clinical history of the first reported sphenoid sinus myxoma, complete with radiographic and histopathologic data, in conjunction with a review of the literature on head and neck myxomas and the management of isolated sphenoid sinus neoplasms. **RESULTS:** A 45 year-old man presented with a one year history of progressive unilateral nasal obstruction. An extensive mass emanating from the sphenoid sinus was detected on CT scan, eroding into the middle cranial fossa laterally, the maxillary sinus anteriorly, the pterygopalatine fossa inferiorly, and the sella turcica and planum sphenoidale superiorly. After establishing a histopathologic diagnosis of myxoma, the lesion was entirely removed through a lateral rhinotomy approach, medial maxillectomy and external ethmoidectomy. The patient remains without evidence of recurrent disease over six months postoperatively. **CONCLUSIONS:** Myxomas are uncommon neoplasms, particularly in the head and neck. To our knowledge, this is the first case of a myxoma arising from the sphenoid sinus reported in the literature.

44. Subglottic Mucopyocele: Diagnosis and Management

Ramzi Younis, MD, Miami, FL
Andres Bustillo, MD, Miami, FL (*Presenter*)

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to discuss the differential diagnosis of subglottic masses in children and the management of subglottic mucopyoceles.

OBJECTIVES: To report a rare case of subglottic mucopyocele as a case of subglottic stenosis in a child, discuss the differential diagnosis of subglottic lesions in children, and to detail the diagnosis and management of subglottic mucopyoceles. **STUDY DESIGN:** A case report and review of the literature. **METHODS:** A case report and review of the literature. **RESULTS:** A 3 year old white male with a history of a tracheostomy at 6 months of age. Findings on direct laryngoscopy and bronchoscopy included a left sided subglottic mass causing stenosis grade 2/3, anterior tracheal wall collapse causing stenosis grade 4, and a large-sized supra and infra-stomal scar tissue. The patient then underwent a single staged anterior LTR with a costal cartilage graft. Intraoperative findings revealed a large left sided subglottic mucopyocele which was marsupialized and drained. **CONCLUSIONS:** Tracheal mucopyoceles are rare entities that may arise anywhere along the tracheal lumen. A review of the literature found two case reports of tracheal mucocoeles causing tracheal narrowing. The differential diagnosis for subglottic lesions should include mucocoeles and mucopyoceles along with the other etiologies such as subglottic hemangioma, webs, atresia, membranous and cartilaginous stenosis. The most likely etiology in this case is intubation trauma to the subglottic region. In conclusion, laryngeal mucopyoceles are very rare entities that should be included in the differential diagnosis of subglottic stenosis or masses, the diagnosis may be very challenging and can coexist with other laryngotracheal anomalies and their treatment may vary from endoscopic drainage to open procedures with grafting.

45. Nontraumatic Atlanto-Axial Subluxation (Grisel's Syndrome): A Rare Complication of Otolaryngological Procedures

Kathy K. Yu, MD, Chapel Hill, NC
David R. White, MD, Chapel Hill, NC
Harold C. Pillsbury, MD*, Chapel Hill, NC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to recognize this rare complication of adenotonsillectomy, discuss its pathogenesis and be prepared to offer early and effective treatment.

OBJECTIVES: Describe the signs and symptoms of unusual complications of otolaryngological procedures, in particular Grisel's syndrome; explain pathophysiology of nontraumatic atlanto-axial subluxation; discuss the role of radiologic investigation to aid in diagnosis; provide a treatment algorithm for conservative management and; discuss the potential devastating complications if unrecognized early in the disease process. **STUDY DESIGN:** Retrospective study of the case record of a child with Grisel's syndrome as well as a review of the literature regarding the pathogenesis, treatment modality, outcome and prognosis

after early and delayed treatment. **METHODS:** Analysis of the clinical presentation, plain radiographs, computed tomography scans and magnetic resonance imaging of a child with Grisel's syndrome after adenotonsillectomy. **RESULTS:** Pathophysiology of atlanto-axial subluxation resolves around the periodontal vascular plexus that drains the posterior superior pharyngeal region. Infectious and inflammatory emboli cause synovial engorgement, damaging paraspinal ligaments. Treatment consists of cervical collar immobilization, muscle relaxants, analgesics and antibiotics. Average delay in diagnosis up to 11 months. **CONCLUSIONS:** Recognition of Grisel's syndrome in addition to other rare complications of adenotonsillectomy requires a high index of suspicion. Early intervention is the critical factor for a good outcome. Unfortunately, a delay in diagnosis is common and can result in catastrophic consequences including functional deficits, cosmetic deformity and in some rare instances, acute death and paralysis.

46. Rhinocerebral Mucormycosis Associated With Osteomyelitis of the Skull Base, Basal Ganglia Infarction, and an Intracerebral Mycotic Aneurysm

Philip E. Zapanta, MD, Washington, DC

Ashmit Gupta, MD, Washington, DC

Nader Sadeghi, MD, Washington, DC

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, the participants should be able to demonstrate the relevant histopathology and radiographic imagery of rhinocerebral mucormycosis. He should also be able to discuss the treatment options and prognosis of this disease.

OBJECTIVES: Invasive fungal sinusitis is classically seen in immunocompromised patients, and it causes a high percentage of morbidity and mortality. Once the fungal elements have invaded the orbit and intracranial cavity, mortality rates can approach eighty percent. With an increasing incidence of immunosuppression, the risk of invasive fungal rhinosinusitis and its complications are increased. We present a unique case of rhinocerebral mucormycosis causing osteomyelitis of the skull base, infarction of the basal ganglia, and a mycotic aneurysm of the middle cerebral artery. **STUDY DESIGN:** Single case report. **METHODS:** A middle-aged gentleman's clinical course is presented and discussed. We review the pertinent incidence, etiology, histopathology, diagnosis, and treatment of rhinocerebral mucormycosis and its associated intracranial complications. **RESULTS:** After rhinocerebral mucormycosis was diagnosed by radiographic imaging and biopsy, amphotericin B lipid complex was initiated. The patient neurologically improved and his field deficits stabilized. No frank evidence of necrosis requiring aggressive surgical debridement was encountered, and he has done well on intravenous antifungal therapy. **CONCLUSIONS:** A review of the literature reveals that rhinocerebral mucormycosis and subsequent osteomyelitis of the skull base and intracranial complications is a rare entity. Due to an increased number of immunocompromised patients, otolaryngologists must maintain a high level of suspicion for invasive fungal rhinosinusitis. With prompt recognition and treatment, invasive fungal rhinosinusitis can be effectively treated, and patients' outcomes are much improved.