

2009 EASTERN SECTION PROGRAM

**JANUARY 23-25, 2009
RENAISSANCE BOSTON WATERFRONT HOTEL
BOSTON, MA**

23rd Friday January

5:00 - Registration - Pacific Ballroom Foyer
7:00 pm

5:00 - Speaker Ready Room Open - Caspian
7:00 pm

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

24th Saturday January

6:30 am - Speaker Ready Room Open - Caspian
5:00 pm

7:00 - Business Meeting (Members Only) - Brewster
7:50

7:00 am - Registration - Pacific Ballroom Foyer
5:00 pm

7:15 - Exhibit Hall Open - Pacific Ballroom A-D
4:45

7:15 - Breakfast with Exhibitors
7:50

8:00 - Spouse Hospitality
11:00

8:00 - Scientific Session
5:45

** Denotes Fellow*

8:00 **Welcome and Introduction of President**
Myles L. Pensak, MD*, Cincinnati, OH
Mark S. Persky, MD*, New York, NY

8:05 - **Presidential Address**
8:20 Myles L. Pensak, MD*, Cincinnati, OH

8:20- **Introduction of Honorees**
8:45 Mark S. Persky, MD*, New York, NY

Guest of Honor
Stanley M. Shapshay, MD*, Albany, NY

Citation Awardees
Stanley M. Blaugrund, MD*, New York, NY
Jonas T. Johnson, MD*, Pittsburgh, PA
Simon C. Parisier, MD*, New York, NY
Robert A. Sofferman, MD*, Burlington, VT
Dr. Persky's Past and Present Residents

8:45 - **Introduction of Guest Speaker and Address**
9:10 **Dilemmas in Health Care and Physician Reimbursement**
Marc Roberts, PhD, Boston, MA

Saturday At-A-Glance

	Concurrent Session I Pacific Ballroom E-H	Concurrent Session II Atlantic 2 & 3
9:15 - 10:15	Laryngology Papers	Head & Neck Panel
10:15 - 10:45	Break with Exhibitors	Break with Exhibitors
10:45 - 11:45	Otology Papers	Rhinology Panel
11:45 - 1:15	Lunch Thesis Seminar	Lunch Thesis Seminar
1:15 - 2:35	Rhinology Papers	Facial Plastics Panel
2:35 - 3:45	Head & Neck Papers	Otology Panel
3:45 - 4:15	Break with Exhibitors	Break with Exhibitors
4:15 - 5:45	Pediatrics/General/ Plastics Papers	Laryngology Panel

Session I: Laryngology Papers

Moderator

Andrew Blitzer, MD DDS*, New York, NY

9:15 The Value of the 532nm Pulsed KTP Laser in Laryngeal Surgery

James A. Burns, MD*, Boston, MA
Aaron D. Friedman, MD, Boston, MA
Matthew J. Lutch, MD, Boston, MA
Robert E. Hillman, PhD, Boston, MA
Steven M. Zeitels, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the value of the pulsed KTP laser in endoscopic laryngeal surgery.

Objectives: In recent years, the 532nm pulsed-KTP (potassium-titanyl-phosphate) laser has emerged as the optimal angiolytic laser for treating mucosal lesions of the larynx in the operating room and the office. Its value has been progressively established in the literature for a variety of lesions yet there has been limited adoption of this technology. Therefore, we sought to assess the current impact of KTP laser in our laryngeal surgery practice. **Study Design:** Retrospective review of 710 patients undergoing endoscopic laryngeal surgery during a one year period. **Methods:** Medical records of endoscopic laryngeal procedures were reviewed of which 386/710 were office based and 324/710 were done in the operating room with general anesthesia. The indications for the procedures were classified by pathology. **Results:** Of the 386 office based procedures, there were 209/386 done with the pulsed-KTP laser and 177/386 endolaryngeal injections. The indications for the office based pulsed-KTP laser procedures were: dysplasia 114/209, papillomatosis 89/209, varix/ectasias 3/209, granuloma 1/209, supraglottic cyst 1/209, foreign body 1/209. The pulsed-KTP laser was used in 178/324 operating room endoscopic laryngeal procedures. The indications for these procedures were cancer 54/178, dysplasia 52/178, papillomatosis 38/178, varices/ectasias 13/178, polyp 6/178, nodule 6/178, stenosis 5/178, granulation 3/178, amyloid 1/178. **Conclusions:** Due to its versatility, the 532nm pulsed-KTP laser is our most utilized instrument for performing endoscopic laryngeal surgery. Widespread adoption of this valuable technology is primarily limited by the cost. It is our hope that this review generates much needed tangible data to assist surgeons with clear indications for the KTP laser while providing them with key information to support institutional investment.

9:24 FIRST PRIZE - JOHN J. CONLEY RESIDENT RESEARCH AWARD A Controlled Safety Study of Diindolylmethane in the Immature Rat Model

Alphi P. Elackattu, MD, Boston, MA
Liling Feng, MD, Boston, MA
Zhi Wang, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the safety of diindolylmethane (DIM) in the treatment of recurrent respiratory papillomas in the pediatric population.

Objectives: DIM, a natural product from cruciferous vegetables, has been shown to be a dietary component that has inhibitory effects on some tumors (e.g., laryngeal papilloma). However, current evidence to support its safety is based on adult humans or mature animals. There is little to show its safety in children. We will determine 1) if oral DIM is safe for these young rats; and 2) if DIM poses a greater risk in immature rats when compared to mature ones. **Study Design:** Prospective controlled animal study. **Methods:** 40 rats will be separated into 4 treatment groups of 10 rats each, based on the amount of study drug they will receive in their daily food: 1. immature rats with low dose DIM, which is our proposed treatment dose (2.0mg/kg/day). 2. Immature rats with high dose DIM (20.0mg/kg/day). 3. Immature rats with no DIM (control). 4. Adult rats with high dose DIM (20.0mg/kg/day). At the conclusion of the study we collect blood to compare comprehensive chemistry tests and endocrinology levels (i.e. 25-Hydroxyvitamin D), and harvest organs to observe for any gross or histological changes between the groups. **Results:** There was no significant difference in the body weights ($P>0.5$) and liver somatic index (LSI, $P>0.1$) between the immature groups, nor was there appreciable difference in any of the chemistry tests ($P>0.05$), endocrinology level ($P>0.1$), or gross or histological examinations between the groups. **Conclusions:** DIM seems to have no adverse affects on rats, including sex-immature ones, even when given in doses 10x what we propose to be therapeutic. This adds evidence to the safety of this drug in the pediatric population as a treatment option for recurrent respiratory papilloma.

9:33 11.7T Proton Magnetic Resonance Microimaging of Laryngeal Tissue Architecture

Victoria L. Herrera, MD, Boston, MA
Jason C. Viereck, MD PhD, Boston, MA
Gerardo Guerra-Lopez, MD, Boston, MA
James B. Kobler, PhD, Boston, MA
Sandeep S. Karajanagi, PhD, Boston, MA
Steven M. Zeitels, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the utility of magnetic resonance (MR) microimaging in translational research for vocal fold implants from the layered microstructure to the deep paraglottic space.

Objectives: High resolution imaging of vocal folds that distinguishes vocal fold layered microstructure and underlying paraglottic space would provide a much needed experimental tool for translational research investigating biomaterial based interventions to treat vocal fold scar and injection medialization. To establish proof-of-concept, we studied whether 11.7T-MR microimaging provides the needed resolution to resolve vocal fold tissue architecture. **Study Design:** We performed ex vivo MR microimaging of fixed ferret and canine larynges determining whether changes in layered architecture can be detected in the presence of scar and subsequent to biomaterial injections into the vocal folds. Post-imaging, serial section histological analyses were done to corroborate observations from MR microimages of vocal folds. **Methods:** Multiple axial and coronal 300 micron slices were obtained using a Bruker Avance 500 wide bore spectrometer (11.7T/500MHz for proton) with gradient echo and rapid acquisition with relaxation enhancement imaging sequences. **Results:** High resolution (39 microns/pixel) MR microimages distinguished vocal fold epithelium, lamina propria, muscle and cartilage in ferret (n=23) and canine (n=4) larynges. In ferret scarred vocal folds, collagen dense scar tissue was distinguishable from normal lamina propria (8/8). MRI detected implant volume and location (24/27) or absence (3/27). **Conclusions:** Ex vivo 11.7T MR microimaging provided high resolution images of ferret and canine laryngeal layered microstructure although the superficial lamina propria could not be clearly distinguished in normal vocal folds. However, detailed comparisons of MR imaging with histology provide insights into the vocal fold trauma, implant residence time and tissue responses, which are valuable for translational research.

9:42 Sports Related Dyspnea in Female Athletes: Diagnosis and Management

Nora Malaisrie, MD, Philadelphia, PA
Cesar E. Ruiz, SLPD, Philadelphia, PA
Brandon L. Prendes, BS, Philadelphia, PA
Lauren M. Campe, CCC/SLP, Philadelphia, PA
Natasha Mirza, MD*, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) include paradoxical vocal fold dysfunction in the differential diagnosis of refractory asthma in athletes; 2) describe methods to help diagnose the condition; and 3) describe multidisciplinary management strategies.

Objectives: Paradoxical vocal fold dysfunction (PVFD) occurs in high achieving, female athletes, yet there is limited literature on this disorder. The condition is characterized by episodes of abnormal adduction of the vocal cords during inspiration resulting in glottic airway obstruction, stridor and dyspnea causing athletes to cease their physical activity. It is often misdiagnosed as exercise-induced asthma and results in improper treatment with bronchodilators, steroids, intubation, or even tracheostomy. The purpose of this study is to report our experience in the diagnosis and management of these patients. **Study Design:** Retrospective case series. **Methods:** The records of five female patients, referred for evaluation of symptoms of exercise-induced dyspnea and wheezing, were reviewed. All patients were female, competitive athletes with symptoms that limited their participation in sports and who had been previously diagnosed and unsuccessfully treated for asthma. **Results:** Two of five patients had findings of PVFD on office laryngoscopy. The remaining three had normal laryngoscopies while asymptomatic and were diagnosed with PVFD based on clinical suspicion and exclusion of asthma. All patients were treated with breathing therapy using biofeedback instruction and three received botulinum toxin injection into the thyroarytenoid muscles. All patients experienced symptom improvement and increased exercise tolerance. All were able to continue with their competitive sports. **Conclusions:** PVFD should be suspected in female athletes with a diagnosis of exercise-induced asthma refractory to treatment. Ideal management of these patients requires a multidisciplinary combination of breathing therapy, biofeedback, and botulinum toxin injection.

9:51 Biofilm Formation in Indwelling Tracheostomy Tubes

Donald H. Solomon, MD, Philadelphia, PA
Bettina A. Buttaro, PhD, Philadelphia, PA
Ahmed S. Soliman, MD, Philadelphia, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the onset, morphology and speciation of biofilms in tracheostomy tubes from a select patient population and relate these biofilm characteristics to multiple patient clinical characteristics.

Objectives: Biofilm presence on indwelling prosthesis has been increasingly recognized over the past decade. The onset, speciation and clinical significance of biofilm formation on in vitro tracheostomy tubes have not been well characterized. The purpose of this study was to evaluate the timing of biofilm formation, to describe biofilm structural characteristics as evaluated by confocal microscopy and correlate these findings with patient clinical characteristics. **Study Design:** Fifteen patients evaluated for tracheostomy tube change by the otolaryngology department at a tertiary care medical center in both the inpatient or outpatient setting were enrolled in this study. Informed consent was obtained from each patient in concert with a detailed history and a discarded tracheostomy tube after its removal and replacement. **Methods:** Tracheostomy tubes were sectioned for both fixation and evaluation via confocal microscopy as well as sonication, dilution and plating of bacteria for evaluation of bacterial density and speciation. Patient data forms were collected and the data correlated with tracheostomy tube biofilm findings. **Results:** All tracheostomy tubes evaluated evidenced some degree of biofilm formation. Density of the biofilm structure correlated with multiple patient factors including duration of tracheostomy tube presence within the patient, amount of tracheal secretions as noted by the patient's caregiver and frequency of suctioning. **Conclusions:** Biofilm formation on tracheostomy tubes appears to be ubiquitous within one week of tracheostomy tube placement. Many patient factors appear to correlate with biofilm density and speciation, but the clinical significance of these findings in terms of tracheostomy stomal induration, erythema, edema and presence of granulation tissue is unclear.

10:00 Use of Test Saline Injection Laryngoplasty as an Estimate of Minimal Glottis Insufficiency (MGI)

Chih-Kwang Sung, MD MS, New York, NY
Peak Woo, MD, New York, NY*

Educational Objective: At the end of this presentation, the participants should be able to understand the principles underlying vocal fold augmentation and use saline injection to predict outcome of surgical augmentation.

Objectives: Patients with dysphonia may have evidence of minimal glottis insufficiency (MGI) as evidenced by small glottal gap, open phase dominance, or phase shift on videostroboscopy. These patients may or may not be helped by surgery. There is even fear of patients feeling worse after treatment. **Study Design:** Retrospective case series analysis. **Methods:** Twenty patients with evidence of MGI (bowing/atrophy = 8, paresis or Parkinson's disease = 8, scar = 4) were treated between 2000-2008 by office test injection of saline. Using a 30 gauge needle, 0.5 mL of saline were injected into each vocal fold via a transcervical route using the lower border of the thyroid cartilage as a landmark. **Results:** All injections were tolerated without complications. Initial voice improvement was noted in 15 of the 20 patients with 11 patients opting to go on to surgery (9 injections, 2 medialization). All eleven patients reported voice improvements similar to results obtained by saline test injection. The duration of good voice lasted from 2 days to 2 weeks. Sulcus and scar patients did worse with test saline injections suggesting their MGI is due to mechanisms other than volume deficiency. **Conclusions:** Test saline injections into the larynx using anatomical landmarks are a simple, cost effective way to screen patients with MGI for surgical augmentation.

10:09 Q&A

10:15 Break with Exhibitors/Poster Viewing - Pacific Ballroom A-D

Session I: Otology Papers

Moderator

Joseph G. Feghali, MD*, Bronx, NY

10:45 Cochlear Implantation in the Very Young Child: Long Term Safety and Efficacy

J. Thomas Roland Jr., MD, New York, NY*
Kevin H. Wang, MD, New York, NY (Presenter)
Sara B. Immerman, MD, New York, NY
Maura H. Cosetti, MD, New York, NY
Susan B. Waltzman, PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate a knowledge of the effects of implantation of children under 12 months of age and discuss surgical/medical issues and auditory and linguistic outcomes.

Objectives: Newborn hearing screening coupled with improved diagnostic tools allowing for more definitive diagnosis of profound sensorineural hearing loss has led to implantation in children under 12 months of age. Initial studies established the safety and efficacy of the procedures in the short term if attention is paid to a variety of medical and surgical issues. The purpose of this study is to demonstrate that cochlear implantation in children under age one is safe and efficacious following an extended period of cochlear implant usage. **Study Design:** Retrospective chart review. **Methods:** 50 children with confirmed severe to profound sensorineural hearing loss received cochlear implants and have been followed at our institution for a period of 1-8 years. 4 children underwent simultaneous bilateral implantation while the remainder received unilateral implants. The main outcome measures were surgical/medical aspects and age appropriate phoneme, word and sentence recognition tests. **Results:** All children had full insertions of the electrode array. One child experienced a postoperative scalp flap necrosis and breakdown, and 2 children had device failures. Successful reimplantation occurred in all cases. All but 2 of the children are developing age appropriate auditory and linguistic skills. The remaining 2 children have cognitive issues which are affecting progress. **Conclusions:** Cochlear implantation in children <12 months of age is safe and efficacious over an extended period of time. Variables including risk/benefit ratio and other factors that influence performance need to be included in the decision making process.

10:54 Virtual Reality Volume Measurement of Vestibular Schwannoma

Aylon Y. Glaser, MD, Newark, NJ

Jeremiah J. Moles, MD, Newark, NJ (Presenter)

Harrison J. Glassman, MD, Newark, NJ

Robert W. Jyung, MD, Newark, NJ

Educational Objective: At the conclusion of this presentation, the participants should be able to compare and contrast the traditional method of linear measurements of vestibular schwannoma with direct volume measurements using virtual reality technology.

Objectives: 1) Use the Dextroscope to measure vestibular schwannoma volumes; 2) compare Dextroscope volume measurements to traditional linear measurements; and 3) assess interobserver variability of Dextroscope volume measurements. **Study Design:** Retrospective review of 13 patients with unilateral vestibular schwannoma undergoing conservative management consisting of observation and serial MRI imaging between May 2005 to March 2007. Patient images were analyzed by three ENT residents using virtual reality technology. **Methods:** The Dextroscope, a commercially available interactive three dimensional system, was used to perform volume measurements of vestibular schwannomas on 32 total scans. The volume measurements were made by three independent observers and analyzed for interobserver variability. A neuroradiology attending also analyzed the patient images using traditional linear measurements. The results of the linear measurements and the volume measurements were assessed for correlation. Statistical methods used include Pearson correlation coefficient and analysis of variance. **Results:** The Pearson correlation coefficients between the three observers performing volume measurements were 0.999, 0.996, and 0.996. The analysis of variance between the observers demonstrated F equal to 0.005, with a significance of 0.995. Pearson correlation between calculated volumes and measured volumes was 0.163, (p=0.211). **Conclusions:** True tumor growth rate may not be appreciated using the calculated linear based volumes. There is excellent interobserver correlation in Dextroscope volume measurements. Volumetric measurements of vestibular schwannomas using the Dextroscope are fast, reliable measures of tumor growth.

11:03 Secondary Treatment of Sudden Sensorineural Hearing Loss—Are Steroids Beneficial?

Benjamin D. Malkin, MD, New York, NY

Leslie A. Nurse, MD, Nashville, TN

Eric E. Smouha, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the value of secondary steroid treatment in patients with sudden sensorineural hearing loss.

Objectives: Patients with sudden sensorineural hearing loss (SSNHL) are often referred to an otologist after failing initial management with oral steroids. The goal of this study was to examine outcomes for this group and to determine whether additional steroids or other secondary interventions might lead to hearing improvement. **Study Design:** We performed a retrospective chart review of patients with SSNHL treated in a tertiary otology practice. **Methods:** Pure tone averages (PTA) and speech discrimination scores (SDS) were analyzed; improvement was defined as a 20-dB gain in PTA or a 20% increase in SDS. **Results:** For the 79 patients included in the study, the mean PTA/SDS at initial and final evaluation was 61 dB HL/44% and 48 dB HL/57%, respectively; thirty-four (43%) showed improvement over the course of their visits. Thirty-three patients were treated with a second course of steroids (oral or intratympanic). Those who showed secondary improvement received treatment earlier post-onset, on average, and were all treated within 25 days of the initial loss. The majority (75%) also had partial improvement after their initial treatment. Intratympanic administration did not yield better results than oral. An additional 8 patients

received only nonsteroid secondary treatments, with sporadic benefit. **Conclusions:** Patients with SSNHL occasionally improve after secondary treatment. Benefit was greatest in patients who presented for retreatment early and who had improved after initial steroid treatment. Further options for secondary treatment are limited; therefore, aggressive initial treatment is of paramount importance.

11:12 **Phosphodiesterase-5 Inhibitors and Sudden Sensorineural Hearing Loss**

Patrick T. Maddox, MD, Lebanon, NH

James E. Saunders, MD, Lebanon, NH*

Sujana S. Chandrasekhar, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe the mechanism of action of phosphodiesterase type 5 (PDE-5) inhibitors and their medical use; and 2) recognize the potential side effect of sudden sensorineural hearing loss (SSHL) with PDE-5 inhibitor use and describe possible pathophysiological mechanisms.

Objectives: We will describe the mechanism of action of PDE-5 inhibitors and the newly recognized side effect of SSHL. **Study Design:** Report of two cases and review of the reported cases to the FDA. **Methods:** Retrospective review. **Results:** We report on two cases and review 23 cases identified from the FDA files. The patients ranged in age from 36-85 and included 3 females. The majority of cases (22 patients) were noted to have unilateral hearing loss. Viagra® was the most commonly implicated drug although cases have been reported for all four PDE-5 inhibitors. Of the 16 cases with outcome data, only 5 cases (31%) had complete recovery. A wide variety of audiometric patterns were seen. **Conclusions:** PDE-5 inhibitors are a relatively new, widely used class of drugs for the treatment of male ED and pulmonary hypertension. The principle action is through vasodilation of specific vascular beds. SSHL is a recently recognized potential complication of PDE-5 inhibitor use. Despite the FDA warning there is only one other case report in the literature of SSHL following PDE-5 inhibitor use. Although the mechanism of toxicity in the ear is unclear, the SSHL is presumed to be due to a disruption of the normal autoregulation of cochlear blood flow. Recovery of hearing seems unlikely. The otolaryngologist should ask about PDE-5 inhibitor use in patients with SSHL.

11:21 **Comparison of Word and Sentence Identification Tests as Audiological Performance Measures after Cochlear Implantation**

David R. Schramm, MD SM, Ottawa, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the utility of the Consonant-Nucleus-Consonant (CNC) word test and the Hearing In Noise sentence Test (HINT) as outcome measures after cochlear implantation.

Objectives: Traditionally both word and sentence identification tests have been used to evaluate speech perception ability. The Consonant-Nucleus-Consonant (CNC) word test is a relatively pure measure of consonant and vowel understanding uninfluenced by sentence context. The Hearing In Noise sentence Test (HINT) is a more intuitive measure of patient function, but may underestimate the degree of disability as only fractions of individual words need to be understood. This study compares the utility of these two outcome measures after cochlear implantation. **Study Design:** Specific patient characteristics associated with audiological performance after cochlear implantation were evaluated in 182 adults with acquired hearing loss using patient data previously collected as part of four Advanced Bionics multicenter observational studies. **Methods:** Both speech perception measures were presented at 70 dB SPL. HINT was administered at +10 dB signal-to-noise ratio (HINT-N). Multivariate linear regression was employed to compare patient characteristics associated with both performance measures 6 months post-implantation. **Results:** Utilizing CNC as the outcome measure, significant patient characteristics were duration of any hearing loss, duration of deafness, and preoperative HINT-Q accounting for 15.29% of the variation. Using HINT-N as the outcome measure, age, duration of deafness, and preoperative implant ear pure-tone average were most important. However, the second best 3 predictor model for both performance measures incorporated age, duration of deafness, and preoperative HINT-Q. Both outcome measures were highly correlated (Pearson $p = 0.80322$). **Conclusions:** Multivariate linear regression yielded similar results with either performance measure. CNC and HINT-N scores were highly correlated. Both appear to be equally valid measures of post-implant audiological performance.

11:30 **EdU as a Non-Immunological Method for Identifying Proliferating Cells in the Regenerating Avian Cochlea**

Andrew J. Kamien, BA, Boston, MA

Christina L. Kaiser, PhD, Boston, MA (Presenter)

Priyanka A. Shah, MA, Boston, MA

Brittany J. Chapman, BA, Boston, MA

Douglas A. Cotanche, PhD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the methods and rationales for labeling proliferating cells in the cochlea. They should be able to compare the new EdU technique with the standard BrdU one for labeling DNA Synthesis (S phase) of the cell cycle and understand the similarities of the two methods, but also explain the benefits that the new EdU detection system has over the traditional BrdU method.

Objectives: The avian cochlea regenerates hair cells following noise damage or aminoglycoside treatment through supporting cell proliferation. Immunocytochemical labeling of BrdU, a thymidine analog, is a popular nonradioactive marker for identifying cells in the DNA Synthesis (S phase) of the cell cycle. However, it requires harsh treatments to denature the double stranded DNA for the antibody to bind BrdU. We explored a new method using EdU as a thymidine analog and a non-antibody azide/alkyne reaction between the EdU and the fluorescent probe. We want to demonstrate that EdU is as effective as BrdU but without the requirement for harsh denaturation or the use of antibodies for detection. **Study Design:** Two week old chicks received a single gentamicin injection followed by a single EdU injection 72h later. The cochleae were extracted 4-8h later and processed for fluorescent detection of EdU. **Methods:** Cochleae were processed for detection of incorporated EdU using the Click-iT® Imaging Kit (Invitrogen) and co-labeled with myosin VIIa antibodies. Whole-mount cochlear preparations were examined with a Zeiss 510 Meta confocal microscope. **Results:** We detected supporting cells that had incorporated EdU into their newly synthesized DNA during the 4-8h following the EdU injection. The intensity and quantity of cells labeled were similar to that seen for BrdU. **Conclusions:** The EdU method is as effective as the BrdU method without requiring harsh denaturation or antibodies to identify proliferating cells. Thus, more antibodies are available for analyzing events in regeneration. Moreover, the non-antibody EdU system allows co-labeling with multiple antibodies to other cellular proteins.

11:39 Q&A

11:45 - Lunch - Atlantic 1
1:15

11:45 - Triological Thesis Seminar (Non-Credit) - Lunch
1:15 Furnished - Brewster - *Open to Candidates, Potential Candidates and Members*

Session I: Rhinology Papers

Moderator

Steven D. Schaefer, MD*, New York, NY

1:15 Treatment Paradigms for Esthesioneuroblastoma: A 16 Year Metaanalysis of 361 Patients
Michael T. Andreoli, BA, Boston, MA
Anand K. Devaiah, MD, Boston, MA (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the general methods related to open and endoscopic treatment of esthesioneuroblastoma; 2) understand key outcomes, including disease status and survival, between the paradigms; and 3) review the strengths and limitations of the metaanalysis methodology.

Objectives: The treatment of esthesioneuroblastoma has evolved over time to include both open and endoscopic methods. There is continued debate over an advantage of one method over another, and merits further analysis of existing evidence. **Study Design:** Literature metaanalysis. **Methods:** A PubMed search was performed of all English language articles with key words "esthesioneuroblastoma" or "olfactory neuroblastoma". A metaanalysis of individual patient data for publications between 1992 and 2008 was conducted, correlating with the earliest discussion of endoscopic treatment for esthesioneuroblastoma. A total of 49 journal articles, comprising 1170 cases of esthesioneuroblastoma, were included in the study. Criteria for metaanalysis inclusion were: 5 or more patients in a study and sufficient patient data resolution to analyze. Twenty-three studies comprising 361 patients met all inclusion criteria. The overall treatment and outcome at final followup of each patient was recorded. Patients were pooled according to treatment techniques and compared to one another using a Kaplan-Meier survival curve analysis and Mann-Whitney test for examining differences in followup times and publication year. **Results:** Log-rank tests showed a greater survival rate for endoscopic surgeries compared to open surgeries (P = 0.0019), even when stratifying publication year (P = 0.0018). There was no significant difference in followup time. Review of Kadish tumor staging for each modality showed larger tumors were more often treated with an open approach, but open and endoscopic survival were comparable. **Conclusions:** These results suggest that endoscopic surgery is a valid treatment method with comparable survival to open surgery. Further prospective analysis will be beneficial.

1:24 Image Guided, Endoscopic Repair of CSF Rhinorrhea Using a Superiorly Based,

Middle Turbinate Rotational Flap

Erik V. Berg, MD, Boston, MA

Elie E. Rebeiz, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the background on CSF rhinorrhea and treatment options; 2) explain steps of image guided, endoscopic surgical technique with middle turbinate rotational flap; 3) understand the outcomes of patients in case series; and 4) recognize this surgical technique is a safe and effective method for treating CSF rhinorrhea.

Objectives: A brief introduction etiology and repair options of CSF rhinorrhea. 1) Explain steps of image guided, endoscopic surgical technique with middle turbinate rotational flap; 2) review the outcomes of patients in case series; and 3) recognize this surgical technique is a safe and effective method for treating CSF rhinorrhea. **Study Design:** Case series consisting of 18 CSF rhinorrhea cases that were surgically treated with image guided, endoscopic repair using a middle turbinate rotational flap. **Methods:** Review of the charts for patients undergoing the surgical repair and the outcome. All patients underwent CT guidance via BrainLab, intrathecal fluorescein with exploration of middle and superior meati and nasopharynx, an ethmoidectomy and/or sphenoidotomy and de-epithelialization of the defect's edges. Septal cartilage was harvested for free graft, and the medial aspect of the middle turbinate was de-epithelialized posteriorly and rotated superiorly (superiorly based flap). Fibrin glue and packing was used in all cases and is described in details. **Results:** Review of charts and data on outcomes of 18 cases for effectiveness of surgical technique and complications. There were no recurrences and no need for further surgical procedures. Additionally, there were no complications of meningitis, flap failure, or other iatrogenic injuries. **Conclusions:** Image guided, endoscopic CSF leak repair with middle turbinate rotational flap is a safe and effective method of repairing CSF leaks, with no recurrences and little to no morbidity in our case series.

1:33 Frequency of a Dental Source for Maxillary Sinusitis

Steven R. Bomeli, MD, Pittsburgh, PA

Barton F. Branstetter IV, MD, Pittsburgh, PA

Berrylin J. Ferguson, MD*, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to identify radiographic dental findings which are potential sources of maxillary sinusitis.

Objectives: To identify radiographic features of odontogenic maxillary sinusitis, and to determine the frequency of these findings in patients with radiographic evidence of maxillary sinus fluid. **Study Design:** Retrospective review of 101 sinus CT scans with unilateral or bilateral maxillary sinus fluid. **Methods:** Each maxillary sinus was graded for extent of fluid, degree of mucosal thickening, and presence of dental pathology. Univariate chi-squared analysis was used to identify potential radiologic and demographic features predictive of sinus fluid. Log-linear analysis with backward elimination was then used to determine which features were independently predictive. **Results:** 124 of the 202 maxillary sinuses (61%) had sinus fluid. Univariate analysis excluded age, gender, and prior surgery as predictive features. The log-linear analysis included the radiographic features of oroantral fistula, periapical abscess, periodontal disease, projecting tooth root, and dental caries. Of these, only oroantral fistula, periapical abscess, and the combination of periodontal disease in a projecting tooth root were identified as significant sources of maxillary sinusitis. In sinuses that were <1/3 opacified by fluid, 17% had a dental source of infection. In sinuses with 1/3 to 2/3 fluid opacification, 53% had an identifiable dental source and in sinuses that were >2/3 opacified by fluid, 79%. Mucosal thickening demonstrated a similar relationship with dental sources, such that sinuses having both >2/3 fluid opacification and moderate mucosal thickening were 86% likely to have an identifiable dental source. **Conclusions:** Odontogenic infections are often the source of maxillary sinusitis, especially if the radiographic findings of sinusitis are severe.

1:42 Sinus CT Findings in Otolaryngology Patients Exposed to the World Trade Center Collapse

Shaun C. Desai, BA, New York, NY

Jacqueline M. Moline, MD, New York, NY

Robin Herbert, MD, New York, NY

Satish Govindaraj, MD, New York, NY

Kenneth W. Altman, MD PhD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to compare and discuss the objective signs of upper respiratory illness and its severity in the unique population exposed to the World Trade Center site following the terrorist attacks on 9/11/01.

Objectives: To identify the presence of objective signs of upper respiratory illness and its severity in the unique population exposed to the World Trade Center site following the terrorist attacks on 9/11/01. **Study Design:** Retrospective chart review.

Methods: A retrospective analysis was completed by examining all patients who presented to the World Trade Center Medical Monitoring and Treatment Programs and were subsequently referred to the senior author from August 2005—January 2008. The charts were analyzed to identify patients who had a CT of the sinuses performed. All sinus CT scans were read to assign a Lund-Mackay staging score as well as to look for relative measure of nasal congestion as defined by greater than 75% bilateral obstruction. Quantitative IgE, as attained from RAST testing, was also analyzed when available. **Results:** In total, 381 patients were identified, of whom 161 patients had sinus CT scans. There were 126 males and 35 females with a mean age of 48.7 years. Average Lund-Mackay score was 4.8 ± 5.2 . Seventy-eight patients (48%) were found by two interpreters to have radiographic confirmation of severe bilateral nasal congestion, as defined by greater than 75% occlusion. Quantitative IgE was performed in 115 patients, but did not correlate with severity of CT scan findings. **Conclusions:** This study objectively documents upper respiratory disease in the form of nasal obstruction and congestion in those patients exposed to the dust plume of Ground Zero. Further studies are warranted including long term followup and possible histological analysis of the nasal mucosa.

1:51 Endoscopic Surgery in Skull Base/Sinonasal Adenocarcinoma: What Evidence Exists?

Matthew K. Lee, BA, Boston, MA

Anand K. Devaiah, MD, Boston, MA (Presenter)

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand key elements in reporting patient outcomes; 2) understand reported clinical characteristics outlined in the available body of literature; and 3) discuss recommendations for future study.

Objectives: To describe and analyze the published literature on the efficacy of endoscopic or endoscopic assisted management of sinonasal and skull base adenocarcinoma (SSBA). **Study Design:** Systematic literature review. **Methods:** A PubMed search of English language articles on endoscopic or endoscopic assisted SSBA was performed. Each article was examined to identify the presence or absence of details that would be useful in making prospective clinical judgment. **Results:** Between 1999 to 2008, 16 papers (150 cases, all retrospective) using endoscopic or endoscopic assisted SSBA were identified. Three (19%) reported ≥ 15 cases of adenocarcinoma with 5 year survival ranging from 53-83%. In all identified papers, five (31%) reported adenocarcinoma specific survival statistics, and eight (50%) provided individual case specifics (patient age, tumor type, tumor stage, disease status, and followup time). Adjuvant therapy was used in twelve studies (75%), with details outlined in six (38%) articles, accounting for 52 of 74 cases (70% of those patients, 35% overall). Adenocarcinoma specific followup was reported in only nine studies (56%); four of these nine articles had a median/mean followup time less than 3 years. Six papers (38%) utilized AJCC guidelines while four (25%) used UICC guidelines. The remaining six papers (38%) did not report on the stage of treated tumors. Four (25%) reported length of hospital stay, eight (50%) reported complication data. Three studies comprising 61 cases (41% of overall patients) recorded disease status, tumor stage, site involvement, and complication rates for each patient. **Conclusions:** While there is growing evidence that SSBA can be employed effectively, increased emphasis on detailed, prospective reporting in future literature is recommended.

2:00 Revision Endoscopic Orbital Decompression in the Management of Graves' Orbitopathy

Man-Kit Leung, MD, Boston, MA

Michael P. Platt, MD, Boston, MA

Ralph B. Metson, MD, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the safety and efficacy of revision endoscopic orbital decompression in patients' with Graves' disease as well as compare outcomes of revision surgery with those of primary endoscopic orbital decompression.

Objectives: Although endoscopic orbital decompression has become the surgical treatment of choice for patients with Graves' orbitopathy, in some cases, progression of disease leads to recurrent proptosis and optic neuropathy. The objective of this study is to determine the safety and efficacy of revision endoscopic orbital decompression in the treatment of patients who present with recurrent vision threatening orbitopathy. **Study Design:** Retrospective case control series in an academic medical center. **Methods:** Records of 187 endoscopic orbital decompressions performed over a 17 year period (1992-2008) were reviewed. Ten patients were identified who underwent 13 revision orbital decompressions (3 bilateral cases). Outcome measures, including reduction in proptosis, improvement in visual acuity, and complication rates, were compared to a control cohort of 10 consecutive patients who underwent primary orbital decompression during the same time period. **Results:** Indications for revision decompression surgery included exposure keratopathy (n=9, 69%), optic neuropathy (n=3, 23%) and diplopia (n=1, 8%). There were no intraoperative complications. Mean reduction in proptosis was 1.4mm less for patients who underwent revision decompression compared to controls, although this difference was not found to be significant (mean decompression 3.6 ± 1.0 mm vs. 5.0 ± 2.1 mm respectively, p=0.09). Visual acuity improved in 62% of revision decompression cases, compared to 21% of controls (p=0.08). Rates for postoperative complications, which included acute sinusitis, chronic sinusitis, and frontal mucocele, were similar between revision decompression and control groups (31% vs. 12% respectively, p=0.36). **Conclusions:** Revision

endoscopic orbital decompression is a safe and effective procedure for the treatment of patients with recurrent Graves' orbitopathy. Clinical outcomes are similar to those for primary endoscopic decompression.

2:09 The Role of Palliative Endoscopic Surgery in Advanced Sinonasal and Anterior Skull Base Neoplasms

Abtin Tabaei, MD, New York, NY

Gurston Nyquist, MD, New York, NY

Vijay K. Anand, MD, New York, NY*

Ameet Singh, MD, New York, NY

Theodore H. Schwartz, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the role of palliative endoscopic surgery in advanced sinonasal and anterior skull base neoplasms.

Objectives: Endoscopic sinonasal and anterior skull base surgery for curative intent has been described for a variety of inflammatory and neoplastic disorders. The role of endoscopic surgery for palliation of advanced sinonasal and skull base neoplasms, however, is unclear. Traditional palliative options include radiation therapy and open surgery but are limited by treatment related morbidity and limited efficacy in symptom control. Endoscopic resection of these lesions may theoretically allow for a minimally invasive approach to control of sinonasal symptoms. **Study Design:** Multi-institutional case series. **Methods:** A multi-institutional review of four patients undergoing endoscopic tumor resection for palliative purposes of advanced sinonasal and skull base neoplasms was performed. Patient demographics, treatment course and postoperative outcome measures were reviewed. **Results:** The histology in this series included metastatic sinonasal mucosal melanoma in 2 patients, metastatic rhabdomyosarcoma in 1 patient and locally advanced chordoma with intracranial involvement in 1 patient. The predominant sinonasal symptoms in all patients related to mass effect (nasal obstruction) and epistaxis. Symptomatic improvement in the targeted symptoms was achieved in all patients despite the poor overall outcome from the underlying lesion. There were no perioperative complications in this series. **Conclusions:** Endoscopic surgery may allow for palliation in advanced sinonasal and skull base neoplasms. The indications for this procedure are individualized based on patient demographics and overall prognosis. Given the low morbidity associated with this procedure, endoscopic surgery may be a viable option for local symptom control in select patients.

**2:18 SECOND PRIZE - RICHARD J. BELLUCCI RESIDENT RESEARCH AWARD
Effects of Zileuton on Leukotriene Receptor Expression on Nasal Mucosal Inflammatory Cells**

Yu-Lan Mary Ying, MD, Pittsburgh, PA

Berrylin J. Ferguson, MD, Pittsburgh, PA*

Raja R. Seethala, MD, Pittsburgh, PA

Elaine Rubinstein, MD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to list ways of exploring the effect of zileuton on patients with chronic rhinosinusitis with nasal polyps.

Objectives: To study the effect of zileuton, a 5-lipoxygenase inhibitor, on expression of cysteinyl leukotriene receptors (CysLT1 R) on inflammatory cells of chronic rhinosinusitis with nasal polyps (CRSwNP). **Study Design:** Prospective blinded case series of histopathology from a nonrandomized, non-blinded clinical trial. **Methods:** Immunohistochemistry staining of CysLT1 R and all leukocytes (CD45+) was performed on biopsies of 19 CRSwNP before and 3 weeks after initiation of zileuton 600 mg QID. The change in ratio of CysLT1 R/CD45+ cells staining was the primary endpoint. Clinical subjective response was studied relative to change in ratio of CysLT1 R/CD45+ cells. **Results:** By scatter graph, a trend of greater reduction in post-treatment ratios of CysLT1 R/CD45+ cells was noted in specimens with initial high pre-treatment ratios, (correlation coefficient, $r = 0.66$, $p = 0.002$). Reduction in ratios of CysLT1 R/CD45+ cells was significant in specimens with initial ratios greater than the median value (0.13), $p = 0.005$ (Dependent-samples t-test). Eight of nineteen patients reported symptom improvement, especially olfaction, but this did not correlate with changes in CysLT1 R/CD45+ ratios. **Conclusions:** Zileuton did not reduce the ratio of CysLT1R/CD45+ cells linearly, rather its effect was significant in patients with ratio of CysLT1 R/CD45+ cells equal to or greater than the median value on entry. Reported symptom improvement was not correlated with reduction in ratio of CysLT1R/CD45+ cells.

2:27 Q&A

Session I: Head & Neck Papers

Moderators

William J. Richtsmeier, MD PhD*, Cooperstown, NY

Clarence T. Sasaki, MD*, New Haven, CT

2:35 Synchronous Ipsilateral Parotid Neoplasms

Phillip L. Chaffin Jr., BS, Pittsburgh, PA

Ryan J. Li, MD, Baltimore, MD

Joshua L. Dunklebarger, MD, Pittsburgh, PA

Robert L. Ferris, MD PhD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) appreciate the incidence of multiple ipsilateral parotid tumors; and 2) recognize the impact that multiple synchronous parotid tumors has on the surgical management of patients presenting with a parotid mass.

Objectives: We determined the incidence of ipsilateral synchronous parotid tumors, their histologies and their impact on surgical management of patients undergoing parotidectomy. **Study Design:** A retrospective analysis of tumor histology and clinicopathologic data for all at risk parotid glands in patients undergoing superficial parotidectomy at a large referral center. **Methods:** The pathology and medical records of patients undergoing superficial parotidectomy for at risk parotid tumors between 1991-2008 were reviewed. Patients with synchronous ipsilateral parotid neoplasms were identified and analyzed for patient demographics, preoperative evaluation and final histological diagnosis. **Results:** Eighty cases of synchronous ipsilateral parotid neoplasms were diagnosed at our center. Of approximately 1870 parotidectomies performed on patients with at risk parotid tumors, 29 patients were treated (incidence 1.55%) for 72 tumors (mean 2.5 tumors per patient). Upon presentation, no patients were identified as having multiple lesions on exam. Twenty-two patients underwent preoperative imaging, and of these three (13.6%) were correctly identified as having multiple parotid lesions. The majority (89.6%) of multiple parotid lesions was identified during intraoperative examination, these were confirmed during histological evaluation. Twenty-six patients (90%) were treated with partial or superficial parotidectomy and facial nerve dissection; the remaining three patients were treated with more aggressive surgery. Approximately 75% of specimens contained multiple ipsilateral Warthin's tumors. Eight patients' parotidectomy specimens (27.6%) contained either malignant tumors (n=5) or tumors with malignant potential (n=3). **Conclusions:** In the era of minimal parotidectomy and capsular dissection approaches, surgical treatment of patients presenting with a parotid mass should consider the risk of synchronous ipsilateral parotid tumors.

2:43 Evaluation of Voice Prosthesis Placement at the Time of Primary TEP with Total Laryngectomy

Daniel G. Deschler, MD, Boston, MA

Glenn W. Bunting, CCC-SLP, Boston, MA

Derrick T. Lin, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the potential advantages and disadvantages of voice prosthesis placement at the time of primary tracheoesophageal puncture (TEP) completed in conjunction with total laryngectomy.

Objectives: To understand the potential advantages and disadvantages of voice prosthesis placement at the time of primary tracheoesophageal puncture (TEP) completed in conjunction with total laryngectomy. **Study Design:** Retrospective chart review. **Methods:** Primary TEP is a well accepted method of voice restoration and is standardly completed with catheter placement intraoperatively, that is replaced with a prosthesis at a later date. This study evaluates intraoperative placement of the voice prosthesis at the time of primary TEP. The charts of all patients undergoing primary TEP in conjunction with total laryngectomy by the senior author from 1/03 through 03/08 were reviewed. All patients had intraoperative placement of the voice prosthesis. **Results:** Thirty patients were identified, 29 of whom underwent laryngectomy for advanced laryngeal carcinoma. 28/29 received preoperative XRT. 29/30 patients had placement of a 20F Indwelling Blom-Singer prosthesis. One patient had a 16F Indwelling Blom-Singer prosthesis placed. No complications were noted with the intraoperative placement. No prostheses were dislodged in the immediate post-op period. 29/30 patients had initial success with voice production. At one year followup, 23/30 (77%) had successful voice. Five failed of recurrent disease, one never achieved successful voice, and one wanted the prosthesis removed, even though voice was achieved. **Conclusions:** The study demonstrates that the voice prosthesis can be safely and effectively placed intraoperatively at the time of primary TEP. Initial successful voice acquisition rates were high, and long-term success was well within the acceptable range. Indications and select advantages relating to the use of this technique will also be presented.

2:51 Asymptomatic Lower Extremity Deep Venous Thrombosis Resulting in Fibula Free Flap Failure

Adam S. Jacobson, MD, New York, NY

Matthew J. Bak, MD, New York, NY
Azita S. Khorsandi, MD, New York, NY
Mark L. Urken, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the utility of preoperative evaluation of the lower extremity venous system prior to free fibular flap transfer.

Objectives: The successful transfer of a free fibula flap depends on many factors both technical and physiologic. Arterial inflow and venous outflow are requirements for a viable transfer. The arterial system is evaluated preoperatively to ensure a healthy peroneal arterial supplying the flap and adequate collateral blood flow to the distal leg via the anterior and posterior tibial arteries. There is little evidence in the literature to support the evaluation of the venous system preoperatively. Recently, our team encountered two cases of occult deep venous thrombosis (DVT) of the peroneal venous system which were recognized during harvest of a fibula free flap, rendering the flaps nonviable. We believe this clinical dilemma could be avoided by risk stratification with medical history and physical exam followed by preoperative imaging of the venous system. In this presentation we review the risk factors for asymptomatic DVT as well as the clinical and radiological modalities for evaluating the lower extremity venous system. **Study Design:** Clinical perspective. **Methods:** The patients' medical history, pre-operative physical exam and imaging are reviewed. Intraoperative findings and postoperative hematologic evaluations are described. **Results:** Two cases of asymptomatic DVT were discovered intraoperatively during free fibula harvest. Review of the patients' medical history revealed an increased risk for DVT. Postoperative hematologic workup was negative. **Conclusions:** Asymptomatic DVT is a devastating finding during a free tissue harvest. Preoperative imaging should be considered in patients with significant risk factors for DVT. Color flow Doppler ultrasonography is a noninvasive and cost effective means of evaluating the arterial and venous system of the lower extremities.

2:59 Outcomes of Prophylactic vs. Therapeutic PEG

Susan E. Langmore, PhD, Boston, MA
Gintas A. Kriscuinas, MA MPH, Boston, MA
Olga A. Podluzhnaya, BA, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the evidence for prophylactic vs therapeutic PEG placement and improved nutritional and swallowing outcomes in patients who receive radiation therapy for head and neck cancer.

Objectives: To determine whether PEG tubes placed prophylactically prior to radiotherapy vs PEG placement as needed yields better nutritional and swallowing outcomes in head and neck cancer patients. **Study Design:** Systematic review of the literature. **Methods:** 67 articles were reviewed (1990 to 2008) that reported nutritional or swallowing outcomes after prophylactic vs therapeutic PEG placement in patients receiving radiation therapy. Outcomes of interest for nutrition (weight loss) covered the period during radiation therapy. Outcomes of interest for swallowing included mean duration of PEG usage in months or percent of patients still needing a PEG one year after radiation therapy. **Results:** There were no randomized or nonrandomized clinical trials. The best evidence came from case control or case series studies (level 3 and 4). Most reports followed only one group. Of those comparing 2 groups, evidence suggests that prophylactic PEG tube placement may help maintain weight better (group difference in weight loss = 3 - 4 kg). Regarding PEG dependence, mean duration of PEG usage was 7 months in the prophylactic group, with 56% of patients PEG dependent after 1 year. Mean duration of PEG placement in the therapeutic group was 5 months, with 17.5% PEG dependent after one year. No studies reported differences in swallowing ability in these two groups. **Conclusions:** Limited evidence suggests prophylactic PEG placement will help patient maintain weight during radiotherapy but may lead to longer PEG duration and a higher number of patients still PEG dependent one year after radiation therapy. A randomized clinical trial is needed.

3:07 Complications of Tracheoesophageal Puncture and Voice Prosthesis Placement

Jennifer Y. Lee, MD, Philadelphia, PA
Grete A. Fries, MS CCC-SP, Bronx, NY
Bradley A. Schiff, MD, Bronx, NY
Richard V. Smith, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) anticipate and recognize local complications after tracheoesophageal punctures; 2) understand the management of common complications of tracheoesophageal punctures; and 3) appreciate the medical impact of changes in insurance policies in tracheoesophageal punctures.

Objectives: 1) Review the local complications in patients with primary and secondary tracheoesophageal punctures; and 2) relate local complications from this study to complication rates published in current literature. **Study Design:** Retrospective cohort study. **Methods:** A retrospective cohort study from November 2001 to August 2007 of 42 patients (36-95 years old) undergoing a Provox II voice prosthesis placement following total laryngectomy. Complications included stomal or puncture

stenosis, fistula enlargement, granulation formation, but did not include leakage, as this was used to determine when to change an indwelling prosthesis. **Results:** In our study, 24 out of 42 patients (57%) had complications. Fifteen patients had more than one complication, leading to a total of 72 total complications. The highest number of complications in a single patient was five. The majority of complications were tracheal or stomal, with 19/42 (45.2%) developing granulation tissue, 10/42 (23.8%) developing puncture site stenosis requiring dilation, 7/42 (16.6%) manifesting stomal stenosis requiring stomoplasty and 10/42 (23.8%) requiring repuncture. Pharyngotracheal fistula formation rate was 10/42 (23.8%) and tracheitis rate was 16/42 (38.0%). Finally, five patients had pharyngoesophageal diverticulae requiring either laser obliteration of the party wall or endoscopic stapling. Current literature reports complication rates of 20-40% for granulations, stenoses and fistulas. **Conclusions:** Our patient population had a higher incidence of complications following TEP than is reported. The etiology of these complications is unknown and merits further study, but could be related to the increased time the indwelling prostheses are left in place following statewide insurance coverage changes which eliminated reimbursement for the devices.

3:15 **A Comparative Analysis of Tumor Registry Databanks: Academic vs. Community Based Head and Neck Cancer Care**

Roger J. Levin, MD, Camp Hill, PA*

Educational Objective: At the conclusion of this presentation, the participants should be able to compare institutional head and neck tumor registry data and identify treatment variations between academic versus community based surgeons.

Objectives: The majority of head and cancer care (HNCC) has historically been performed at academic medical centers. Recently, however, many community based hospitals have also established cancer centers with the goal being to provide comprehensive care of this patient population. Patients with breast, prostate, and colorectal tumors have benefited; this cancer center approach is also applicable to HNCC. **Study Design:** To determine whether an adequate volume of HNCC is delivered in the community a tumor registry comparison was performed. Three central state community based cancer centers and two regional academic cancer centers were evaluated. **Methods:** Head and neck cancer registry data was obtained from community center #1, community center #2, community center #3, academic center #1, and academic center #2. Five years of data (2002-2007) was evaluated with emphasis on cancers of the oral cavity/oropharynx (OC/OP), larynx/hypopharynx, and thyroid. Total cases, disease stage and, number of analytic versus non-analytic cases was abstracted and compared. **Results:** Sampling the data from 2004 regarding OC/OP cancer cases show a range from 25-68 (low=community center #2, high=academic center #2), larynx cancer a range from 15-40 (low=community center #3, high=academic center #2), and thyroid cancer a range from 34-74 (low=community center #1, high=academic center #1). Data from 2006 for OC/OP shows a range from 28-91 (low=community center #3, high=academic center #2), larynx 10-37 (low=community center #3, high=academic center #2) and thyroid 43-90 (low=community center #3, high=community center #2). **Conclusions:** Moderate differences are seen between HNCC case volume in academic versus community based cancer centers. Not surprisingly, thyroid cancer management is often provided in the community, though complex oral cancer more often occurs at major academic cancer centers. Possible reasons for these variations will be discussed.

3:23 **Management of Carotid Blowout Syndrome**

Samir S. Undavia, MD, Bronx, NY

Richard V. Smith, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand carotid blowout syndrome and the advantages and disadvantages of all treatment modalities.

Objectives: To review the management and outcomes of head and neck cancer patients with carotid blowout syndrome (CBS). **Study Design:** Retrospective chart review at a tertiary academic medical center. **Methods:** The charts of seven patients with CBS were examined and the English language literature was reviewed. **Results:** Seven patients, two females and five males, with a mean age of 55 years (range 35-80), were studied; four with larynx cancer, three with hypopharynx cancer. Most patients were treated with initial chemoradiation (6/7), and 4 had salvage surgery as well. The carotid artery was managed as follows: stenting in 2 patients (1 threatened, 1 impending CBS), coil embolization in 2 patients (1 threatened, 1 impending CBS), and 3 patients with acute CBS were unable to receive intervention. Six of the seven patients are deceased; three from acute CBS, one secondary to coil embolization, and two from disease progression. Stented patients suffered no complications, while both patients receiving coil embolization suffered strokes. Literature review reveals that stenting has clear advantages when compared to traditional approaches, although no clear protocol exists for handling impending and threatened CBS patients. **Conclusions:** Ambiguity exists regarding the use of stents for patients with CBS. The current management of CBS is predominantly reactive and less focused on anticipation and prevention. The use of endovascular stents appears to be a safe and effective way to treat patients with impending and acute CBS and also those with threatened CBS. Management strategies should evolve to be more proactive, preventing life threatening bleeds.

3:31 **Impact of Gender on Survival in Head and Neck Squamous Cell Carcinoma**

Hien Tue Tierney, MD, Boston, MA

Neil Bhattacharyya, MD*, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the influence of gender on survival outcomes in head and neck cancer.

Objectives: To determine if gender independently influences survival for head and neck squamous cell carcinoma (HNSCCA).
Study Design: Population based cohort analysis. **Methods:** Cases of oral tongue, tonsillar and glottic SCCA were extracted from the Surveillance, Epidemiology, and End Results (SEER) database (1988-2003). For each female patient, a randomly selected male control was matched for year and age at diagnosis, race, stage, surgical treatment and radiotherapy. For each primary site, TNM stage was determined and Kaplan-Meier survival comparisons for both overall and disease-specific survival (DSS) were conducted between the matched pairs. **Results:** For oral tongue carcinoma, 858 matched pairs were examined. Overall mean survival for females was 109.7 months versus 98.6 months for males ($p=0.091$). Mean DSS was 159.4 months versus 154.0 months for males ($p=0.825$). Stratified for stage, no significant differences in DSS were noted. For tonsillar carcinoma, 404 matched pairs were examined. Overall survival was 91.0 months for females versus 87.9 months in males ($p=0.221$). DSS was 146.4 months versus 150.6 months in males ($p=0.891$). Stratified for stage, females exhibited slightly poorer DSS for stage I tumors ($p=0.047$). For laryngeal carcinoma, 1,009 matched pairs were examined. Overall survival was 119.6 months for females versus 103.5 months in males ($p<0.001$). DSS was 191.7 months versus 187.3 months in males ($p=0.190$). Stratified for stage, no significant differences in DSS were noted. **Conclusions:** Female gender confers a slight overall survival advantage in HNSCCA but does not significantly influence DSS. Treatment protocols for HNSCCA should not be biased according to gender.

3:39 Q&A

3:45 Break with Exhibitors/Poster Viewing - Pacific Ballroom A-D

Session I: Pediatrics/General/ Plastics-Aesthetics Papers

Moderator

Kenneth M. Grundfast, MD*, Boston, MA

4:15 Early Diagnosis and Contemporary Management of Cervical Necrotizing Fasciitis

Judy W. Lee, MD, New York, NY

Luc G.T. Morris, MD, New York, NY

Sara B. Immerman, MD, New York, NY

David Myssiorek, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the importance of prompt diagnosis and management of cervical necrotizing fasciitis in an algorithmic fashion.

Objectives: Necrotizing fasciitis of the head and neck carries high morbidity and mortality and is uncommon with only 200 reported cases. Given its protean manifestations, we propose an algorithm for diagnosis and management of cervical necrotizing fasciitis. **Study Design:** Case series with review of literature. **Methods:** Of six patients, two were diabetic. Three presented with abscesses, one with supraglottitis, and two with isolated anterior cervical cellulitis. Common presenting symptoms included sore throat, fever, and neck pain. On initial imaging, only three presented with subcutaneous air. Five underwent surgical debridement; one refused intervention and died of respiratory complications. Two had mediastinal extension requiring thoracotomy. Three required tracheotomy, and four wounds closed via secondary intention. There were two mortalities. **Results:** The severity of cervical necrotizing fasciitis and its rapid spread necessitate early diagnosis and management. This disease has widely varying presentations, ranging from mild localized cellulitis to deep neck infections with subcutaneous emphysema and mediastinitis. Treatment includes broad spectrum antibiotics with prompt and aggressive surgical debridement. A high index of suspicion should be maintained in cases of neck cellulitis with nonspecific clinical findings, especially in diabetic or immunocompromised patients. A normal CT does not rule out necrotizing fasciitis. Incisional biopsy of deep cervical fascia may be helpful in some cases. Immediate airway control is essential, and early tracheotomy may be helpful. Reconstruction should be delayed until infectious resolution has been well established. **Conclusions:** Cervical necrotizing fasciitis is an uncommon, life threatening disease which can present innocuously. This review may be helpful in facilitating prompt diagnosis and management of this entity.

4:24 Safety and Efficacy of Balloon Dilation in Treating Pediatric Subglottic Stenosis

John P. Bent, MD*, Bronx, NY

Maulik B. Shah, MD, Bronx, NY (Presenter)
Ryan S. Nord, MS, New York, NY
Sanjay R. Parikh, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the technique for balloon dilation in the treatment of subglottic stenosis and determine appropriate clinical indications.

Objectives: To assess the safety and efficacy of balloon dilation in the treatment of pediatric subglottic stenosis. **Study Design:** Retrospective chart review in the setting of a tertiary care children's hospital. **Methods:** All subjects, under the age of 18, with subglottic stenosis treated with balloon dilation between June 2007 and August 2008 were included. The records were analyzed for patient demographics, presenting symptoms, surgical technique, and airway description. Outcome measures were airway diameter, postoperative symptoms, tracheotomy status and complications. **Results:** Six patients underwent 12 procedures with an average age at procedure of 20 months (range: 3 months to 4 years) without complication. Patient presenting symptoms were stridor (4) or current tracheotomy (2). Five patients were status post LTP. Vascular balloons (6-10mm x 20mm) were inflated to 10 or 12cm H₂O and localized in the subglottis for an average of 45 seconds (range: 15-120). Each procedure consisted of 1-3 dilations cycles. Immediate post-dilation airway diameter increased by an average factor of 2.5 (range: 2.0-3.3). Four patients had repeat procedures in order to further increase airway patency with an average interval between dilations of 25 days (range: 6-56). Stridor was noted to be eliminated or greatly improved in all patients on the first postoperative day; 4 patients sustaining this benefit with an average followup time of 6 months (range: 3 months to 7 months). One patient who was previously being maintained with intubation required a tracheotomy. Of the 2 patients who had a tracheotomy tube in place at the time of the procedure, 1 was successfully decannulated after the procedure. The airways of the 2 patients who did not respond well to dilation long term were assessed at the time of the procedure and noted to have mature scar tissue whereas the responders did not. **Conclusions:** Our results show that balloon dilation is a safe procedure that should be considered in the management of subglottic stenosis in children. This technique seems most applicable to airways that have thin and/or immature stenoses.

4:33 Association between IRF6 and Nonsyndromic Cleft Lip with or without Cleft Palate

Gillian R. Diercks, BA, New York, NY
Tom T. Karnezis, MD, San Diego, CA
David T. Kent, BA, New York, NY
Joseph H. Lee, DrPH, New York, NY
Joseph Haddad Jr., MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the epidemiology of cleft lip and palate, demonstrate an understanding of van der Woude syndrome and its genetic basis, and compare the association between SNPs in IRF6 and nonsyndromic clefting in our previously studied populations.

Objectives: Interferon regulatory factor (IRF6), the gene that causes van der Woude syndrome (VWS), is also a candidate gene for nonsyndromic cleft lip with or without cleft palate (NSCLP). A number of studies have examined the relationship between single nucleotide polymorphisms (SNPs) within IRF6 and NSCLP. Here we evaluate the contribution of IRF6 to NSCLP in a previously unstudied population. **Study Design:** This is a family based association study. To increase the genetic load of the study population, we targeted NSCLP probands with relatives also affected by clefting. **Methods:** Subjects were recruited through a craniofacial clinic. Pedigree information and whole blood were obtained from affected and unaffected members of families reporting 2 or more members with clefting and at least 1 case of NSCLP. 5 SNPs within IRF6 were examined using a family based association method. **Results:** Our study group consisted of 284 individuals from 65 families. 23 (35.4%) of families reported 3 or more affected members. All SNPs were in Hardy Weinberg equilibrium, minor allele frequencies of polymorphic markers ranged from 0.268-0.338, and 3 SNPs were in tight linkage disequilibrium ($D' > 0.9$). In contrast to previously reported positive associations with NSCLP in other populations, we were not able to confirm associations with NSCLP using single point analysis ($0.13 < p\text{-value} > 0.85$) in our sample. **Conclusions:** Although SNP coverage of IRF6 was limited, this study suggests that IRF6 was not associated with NSCLP in our population. This is the first study to report on IRF6's contribution to the etiology of NSCLP in our population.

4:42 The Lipid Laden Macrophage Index as a Marker of Aspiration in Pediatric Patients with Laryngeal Clefts

Stephen M. Kieran, MB BCh BAO MRCSI, Boston, MA
Eliot S. Katz, MD, Boston, MA
Rachel Rosen, MD MPH, Boston, MA
Umakanth A. Khatwa, MD, Boston, MA
Thomas Martin, MD, Boston, MA
Reza Rahbar, DMD MD*, Boston, MA

Educational Objective: This study will discuss the role of the lipid laden macrophage index in the assessment of pediatric laryngeal clefts. The lipid laden macrophage index will be explained and its utility demonstrated when compared to modified barium swallow.

Objectives: Laryngeal clefts are uncommon congenital anomalies that may cause aspiration, leading to considerable morbidity including respiratory distress and recurrent pneumonias. The lipid laden macrophage index (LLMI) is a potential marker of pulmonary aspiration. The objective of this study was to assess the utility of the lipid laden macrophage index as a marker of aspiration in children with laryngeal clefts. **Study Design:** An institutional review board approved prospective cohort study. **Methods:** All patients underwent direct laryngoscopy with rigid bronchoscopy to establish the diagnosis of laryngeal cleft and flexible bronchoscopy with bronchoalveolar lavage. The lipid laden macrophage index was measured from bronchoalveolar lavage. A modified barium swallow (MBS) was used to classify patients into 2 groups (documented aspiration, no documented aspiration). Statistical difference between groups was analyzed using the independent t-test. **Results:** Thirty-one patients were assessed, 15 with a type I cleft and 16 with a type II cleft. 19 patients were male. Nineteen patients were shown to aspirate at least thin fluids when assessed using modified barium swallow. The LLMI was significantly higher in those patients with documented aspiration (45.6 ± 18.1 , normal value: 10) compared to those without documented aspiration (31.6 ± 17.1) on MBS ($p < 0.05$). There was no difference in the LLMI of patients with Type I (42.7 ± 19.4) or Type II (37.9 ± 18.5) laryngeal clefts ($p = 0.48$). **Conclusions:** The lipid laden macrophage index is a clinically useful marker of aspiration in patients with laryngeal clefts and may predict those patients who will benefit from surgical repair.

4:51 **Segmental Hemangiomas of the Upper Airway: Characterization of Anatomic Distribution**

Teresa M. O, MD, New York, NY
Ronda E. Alexander, MD, New York, NY
Nazaneen N. Grant, MD, New York, NY
Andrew Blitzer, MD, New York, NY*
Milton Warner, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the spectrum of anatomic sites affected by segmental airway hemangiomas, discuss the various modalities for the management of laryngeal hemangioma, and explain the indications for therapeutic modalities.

Objectives: To characterize the anatomic distribution of segmental hemangiomas of the larynx and to describe indications for treatment modalities. **Study Design:** Retrospective chart review. **Methods:** We performed a retrospective chart review of patients with cutaneous hemangiomas at a tertiary care center over a 4 year period. Only patients with upper airway hemangiomas were studied. We reviewed the anatomic distribution of hemangiomas within the upper airway and the treatment course of each patient. **Results:** Of 1,226 patients with cutaneous hemangiomas, 108 (9%) were segmental in distribution and 56 of these (52%) had a V3 distribution pattern. There were 16 patients (29%) with upper airway involvement. All of these patients had associated V3 or mandibular segmental hemangiomas. As with the cutaneous manifestation, the distribution of hemangioma within the upper airway was segmental. This included the following anatomic sites: oropharynx, hypopharynx, as well as intrinsic structures of the larynx such as the epiglottis, ventricular folds, aryepiglottic folds and subglottis. Many of these patients had diffuse mucosal involvement including tracheal involvement. Eleven of 16 patients underwent medical intervention while 7 required surgical intervention. No patient was managed with observation alone. Medical management included systemic (8 patients) and intralesional (2) steroids. One patient received chemotherapy prior to referral. Surgical treatment included tracheostomy (4 prior to referral), laser ablation of subglottic involvement (2) and 1 required both a tracheostomy and laser ablation. **Conclusions:** A high percentage of patients with V3 hemangiomas will manifest with upper airway obstruction, the distribution of which is segmental. Treatment should take this diffuse pattern of involvement into consideration.

5:00 **Voice and Airway after Laryngeal Trauma in Children**

Alicia M. Quesnel, MD, Boston, MA
Christopher J. Hartnick, MD MsepI, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss diagnostic and management strategies for optimizing voice and swallowing outcomes in the pediatric patient with laryngeal trauma. Participants should be able to explain the utility and shortcomings of videostrobolaryngoscopy and to discuss some indications for open, endoscopic, or combined surgical approaches in the management of pediatric laryngeal trauma.

Objectives: To discuss four cases of pediatric laryngeal trauma which highlight current techniques in diagnosis and treatment of the voice following laryngeal trauma. To examine the utility of videostrobolaryngoscopy and to explore the current uses for open, endoscopic, or combined approaches in pediatric laryngeal trauma. **Study Design:** Case series. **Methods:** A case series of four children, ranging from 6 weeks old to 18 years old, who sustained laryngeal trauma is presented. The diagnosis-

tic evaluation and treatment strategies are reviewed. Videos of operative repairs and voice evaluations with strobolaryngoscopy will be shown. **Results:** A 15 year old boy who sustained blunt neck trauma was diagnosed with a vocal fold avulsion on videostrobolaryngoscopy and a significant mucosal tear with exposure of the paraglottic space on endoscopic examination. Anatomical reapproximation required a combined open and endoscopic repair. A 17 year old football player developed a glottic hematoma after cervical blunt trauma, which was managed conservatively with serial strobolaryngoscopy. A 6 week old male suffered vocal fold avulsion from a traumatic intubation. Laryngofissure with reattachment of the vocal fold allowed swallowing without aspiration and return of laryngeal EMG activity. An 18 year old boy, with prior laryngeal trauma at age 10 and resultant glottic cicatricial bands, desired improved vocal endurance and quality. Videostroboscopy allowed evaluation of phonatory mechanics in order to tailor therapy to his goals. **Conclusions:** Imaging and strobolaryngoscopy may help direct management of pediatric laryngeal traumatic injuries. Open, endoscopic, and combined approaches may be used to optimize voice outcomes in pediatric laryngeal trauma.

5:09 Chorda Tympani Injury during Cochlear Implantation: Assessment by Electrogustometry

James D. Ramsden, MD, Toronto, ON Canada
Blake C. Papsin, MD, Toronto, ON Canada (Presenter)*
Karen Gordon, PhD, Toronto, ON Canada
Randy Leung, MD, Toronto, ON Canada

Educational Objective: At the conclusion of this presentation, the participants should be able to interpret electrogustometry results and be aware of chorda tympani injury during cochlear implantation and especially bilateral cochlear implantation.

Objectives: To assess the injury to chorda tympani nerve during pediatric cochlear implantation. **Study Design:** Pediatric cochlear implant clinic, cross-sectional study. **Methods:** Forty-one children attending outpatient review following cochlear implantation were evaluated (mean age 9.8, range 3.9 to 18 years). Twenty children had bilateral cochlear implants and 21 had single implants. Both children and parents completed a questionnaire examining taste or salivary disturbance. Electrogustometry was performed using a standardized protocol. Abnormal results were defined as ≥ 16 dB or a difference of 6dB between ears. **Results:** Only one child reported temporary taste disturbances following surgery. All children were able to perform electrogustometry (EGM). Of the 61 implanted ears, 7 (11.5%) had thresholds of 16dB consistent with absent chorda tympani function. A further 4 (6.6%) had a threshold difference of >6 dB between the ears. All bilaterally implanted children had normal results in both ears. **Conclusions:** EGM provides an objective measure of chorda tympani dysfunction in children. Although our cohort of children rarely reported taste disturbance, 18.1% demonstrated chorda tympani dysfunction. This was not associated with bilateral cochlear implantation. Conclusion: Electrogustometry is a useful tool for assessing taste dysfunction in children after cochlear implant surgery. Careful preservation of the chorda tympani is particularly important in bilateral implantation.

5:18 A Prospective Randomized Evaluation of Scar Assessment Measures

Michael G. Brandt, BSc MD, London, ON Canada
Corey C. Moore, MD MSc, London, ON Canada
Kevin Fung, BA MD, London, ON Canada
Jason H. Franklin, BSc MD, London, ON Canada
John Yoo, MD, London, ON Canada
Philip C. Doyle, PhD, London, ON Canada

Educational Objective: At the conclusion of this presentation, the participants will demonstrate a clear understanding of the limitations of current scar assessment instruments. Participants will better understand the challenge of objectively quantifying subjective psychophysical dimensions. Finally, participants will gain a greater appreciation for the importance of valid scar assessment tools in evaluating treatments and strategies to improve skin scarring.

Objectives: To determine the efficacy of interventions to improve skin scarring, a valid assessment instrument must be used. Current tools used for the evaluation of skin scarring employ equal appearing interval (EAI) scales that assume scar dimensions conform to linear models. While some scar features meet these assumptions, others may not be accurately described. This study determined if current methods of scar evaluation validly characterize inherent features of scars, and in doing so, empirically validated if specific scar dimensions were best represented by linear or nonlinear mathematical models. **Study Design:** Prospective, randomized, cross-over trial. **Methods:** 27 observers evaluated 30 scar photos utilizing both equal appearing interval (EAI) and direct magnitude estimation (DME) scaling methods. The method of scaling and the assessed dimensions of vascularity, pigmentation, thickness, pliability, and surface area were randomized. EAI and DME data were evaluated to identify whether each scar dimension conformed to linear or curvilinear mathematical models. **Results:** Best fit analysis revealed the dimensions of vascularity and pigmentation to be more accurately described using curvilinear functions, while pliability, thickness and surface area were best defined using linear models. **Conclusions:** The scar dimension under assessment must be considered when attempting to validly apply an assessment instrument. Several commonly evaluated dimensions of skin scar-

ring are not appropriately characterized using linear EAI scales. Thus, present assessment instruments must be revised to account for this aberration to allow for a valid means of objectively evaluating skin scarring.

5:27 Efficacy of Shortened Recovery Room Time for Intracapsular Tonsillectomy in Pediatric Patients

Joshua D. Rosenberg, MD, Bronx, NY

Marc J. Gibber, MD, Bronx, NY

John P. Bent, MD, Bronx, NY*

Babak Sadoughi, MD, Bronx, NY

Sanjay R. Parikh, MD, Bronx, NY

Maha K. Bassila, MD, Bronx, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss 1) different postoperative observation protocols for tonsillectomy patients; and 2) discuss the efficacy of using short postoperative observation periods for select patients undergoing intracapsular tonsillectomy.

Objectives: To determine if a more liberal recovery room discharge protocol for intracapsular tonsillectomy impacted postoperative complications when compared to stricter protocols for extracapsular tonsillectomy techniques. **Study Design:** Retrospective case control. **Methods:** All outpatient pediatric tonsillectomies performed from August 2005 to June 2007 were reviewed. All patients for whom complete records were available were included in the study. Surgeries were performed either directly or under the supervision of three pediatric otolaryngologists using either electrocautery tonsillectomy (ET), Coblator tonsillectomy (CT) or microdebrider assisted intracapsular tonsillectomy (IT). **Results:** A total of 575 patients were divided into three groups based on the surgical technique used (Group 1: ET n = 198, Group 2: CT n = 144, Group 3: IT n = 235). The average ages were 6.4 years in the ET group, 5.5 years in the CT group and 6.0 years in the IT group (p < 0.277). The average postoperative recovery times among groups 1 and 2 were 247.6 and 233.1 minutes (p < 0.005). The mean recovery room time for group 3 was 131.9 minutes (p < 0.0001). There was no statistical significant difference between the recovery room times for patients less than three years old compared with those older in any group. Patients in the IT group required statistically significant less doses of intravenous narcotics and anti-emetics during the postoperative observation period (p < 0.0001 respectively). The immediate and delayed complication rates (poor oral intake and/or postoperative hemorrhage) among the ET and CT groups were 29 patients (14.6%) and 25 (17.4%) compared with in three (1.3%) in the IT group (p < 0.001). In both the ET and CT groups there was one episode of immediate postoperative hemorrhage requiring return to the operating room within the first four hours after surgery. There were no instances of immediate or delayed postoperative bleeding requiring return to the hospital or clinic among group 3. **Conclusions:** Microdebrider assisted partial tonsillectomy may allow for shorter postoperative observation time compared with other techniques involving complete removal of the palatine tonsils. Although patients undergoing Coblator assisted complete tonsillectomy required statistically significant less recovery room time compared to electrocautery tonsillectomy, the risk of immediate postoperative hemorrhage may warrant observing patients for a period of at least four hours.

5:36 Q&A

5:45 - Meet the Authors Poster Reception -

7:30 Pacific Ballroom A-D

Session II: Head & Neck Panel

9:15 - PANEL: THYROID CANCER - BACK TO BASICS

10:15 Moderator: *Jonas T. Johnson, MD*, Pittsburgh, PA*

Panelists: *Jeremy L. Freeman, MD, Toronto, ON Canada*

Gady Har-El, MD, New York, NY*

Gregory W. Randolph, MD, Boston, MA

Ashok R. Shaha, MD, New York, NY*

10:15 Break with Exhibitors/Poster Viewing - Pacific Ballroom A-D

Session II: Rhinology Panel

10:45 - PANEL: FRONTAL SINUSOTOMY: BALLOON TO

11:45 OBLITERATION

Moderator: *Ralph B. Metson, MD*, Boston, MA*

Panelists: *David W. Kennedy, MD*, Philadelphia, PA*
William Lawson, MD, New York, NY*
Brent A. Senior, MD, Chapel Hill, NC*
Michael Setzen, MD, Manhasset, NY

11:45 - Lunch - Atlantic 1
1:15

11:45- Triological Thesis Seminar (Non-Credit) - Lunch
1:15 **Furnished - Brewster - Open to Candidates, Potential Candidates and Members**

Session II: Facial Plastics Panel

1:15 - PANEL: TREATMENT OF FACIAL PARALYSIS - ACUTE
2:35 AND CHRONIC - FROM THE SIMPLE TO THE COMPLEX CARE

Moderator: *Mack L. Cheney, MD, Boston, MA*

Panelists: *Aaron Fay, MD, Boston, MA*
Tessa A. Hadlock, MD, Concord, MA
Christopher J. Linstrom, MD, New York, NY*

Session II: Otology Panel

2:35 - PANEL: UNDERSTANDING VERTIGO AS A
3:45 CONSEQUENCE OF PERIPHERAL VESTIBULAR DYSFUNCTION

Moderator: *Julian M. Nedzelski, MD*, Toronto, ON Canada*

Panelists: *Steven D. Rauch, MD*, Boston, MA*
Michael J. Ruckenstein, MD, Philadelphia, PA*
Charles Della Santina, MD, Baltimore, MD
David A. Schessel, MD PhD, East Setauket, NY

3:45 Break with Exhibitors - Pacific Ballroom A-D

Session II: Laryngology Panel

4:15 - PANEL: MY WORST COMPLICATION AND HOW I
5:45 HANDLED IT - SURGICAL, FAMILY AND LEGAL CONSIDERATIONS

Moderator: *Robert T. Sataloff, MD DMA*, Philadelphia, PA*

Panelists: *Ramon A. Franco Jr., MD, Boston, MA*
Denis C. Lafreniere, MD, Farmington, CT
Clark A. Rosen, MD, Pittsburgh, PA*
Peak Woo, MD, New York, NY*

5:45 - Meet the Authors Poster Reception -
7:30 pm Pacific Ballroom A-D

25th Sunday
January

6:30 - Speaker Ready Room Open - Caspian

11:00 am

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

7:00 - **Registration - Pacific Ballroom Foyer**
11:00

7:15 - **Exhibit Hall Open - Pacific Ballroom A-D**
11:00 am

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

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

8:00 - **Scientific Session**
11:15

8:00 - **Announcements**
8:15 **Recognition of New Candidates for Fellowship**
Recognition of Triological Society Grant Awardee
Devraj Basu, MD, Philadelphia, PA
Recognition of Resident Research Award Recipients
Alphi P. Elackattu, Boston, MA
Yu-Lan Mary Ying, MD, Pittsburgh, PA
Harrison W. Lin, MD, Boston, MA
Recognition of Poster Award Winners

8:15 - **PANEL: PEARLS FOR DEVELOPING A PRACTICE -**
9:30 **GOOD ADVICE FOR THE YOUNG PHYSICIAN**
William M. Mandell, Esq., Boston, MA
Mark S. Persky, MD*, New York, NY

9:30- **Break with Exhibitors/Poster Viewing - Pacific A-D**
9:55

9:55 - **RESIDENT PANEL: CHALLENGING CASES FOR THE**
11:10 **RESIDENT PHYSICIAN**
Moderators:
David W. Kennedy, MD, Philadelphia, PA*
Simon C. Parisier, MD, New York, NY*
Stanley M. Shapshay, MD, Albany, NY*
Resident Panelists:
Leslie Winter, MD, Boston, MA
Michael C. Singer, MD, Brooklyn, NY
Sharon L. Cushing, MD, Toronto, ON Canada
Alec Vaezi, MD PhD, Pittsburgh, PA
Adam J. LeVay, MD, New Haven, CT

11:10 **Introduction of Vice President-Elect**

11:15 Adjourn

SCIENTIFIC POSTER PROGRAM

Head & Neck

E1. Cutaneous and Skull Metastases of Papillary Carcinoma of the Thyroid: A Case Report and Literature Review

Yoon-Soo Bae, BS, Boston, MA
Leslie K. Winter, MD, Boston, MA
Scharukh Jalisi, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe various rare presentations of metastatic thyroid cancer; and 2) explain the different modalities for treatment of metastatic thyroid cancer.

Objectives: To report a case of papillary carcinoma of the thyroid with cutaneous and skull metastases. **Study Design:** Retrospective chart review. **Methods:** A 63 year old female with a multinodular goiter was referred to the head and neck service by her endocrinologist. CT of the head, neck, and thorax showed extension of the goiter into the left mediastinum, multiple calvarial lesions, multiple pulmonary nodules, and a T1 thoracic vertebrae mass concerning for bony metastases. On exam she also had a 4 cm by 3cm lesion on the right parietal scalp overlying a parietal skull mass. We present the workup and management of this patient with multiple metastases of her thyroid cancer. **Results:** The patient underwent a total thyroidectomy with biopsy of the right parietal scalp and skull mass. The final pathology showed follicular variant of papillary thyroid carcinoma in the thyroid, skull, and scalp tissues. Interestingly there was no transcapsular or vascular invasion of the thyroid gland. **Conclusions:** Follicular variant of papillary carcinoma can undergo distant metastasis many years after initial presentation. Scalp and skull metastases are rarely noted in thyroid carcinoma but portend a poor prognosis once they occur.

E2. PET, PET/CT, and Head and Neck Squamous Cell Carcinoma: Is it time to Review the NCCN Guidelines?

Jeffrey Cheng, MD, New York, NY
Lale Kostakoglu, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the strengths and weaknesses of PET and PET/CT in the management of head and neck squamous cell carcinoma. They should also demonstrate an understanding of the lack of clinical guidelines in the surveillance of head and neck squamous cell carcinoma and how PET and PET/CT may be able to help improve clinical outcomes.

Objectives: Early detection and accurate staging of head and neck squamous cell cancer (HNSCC) is essential for treatment planning and strongly influences prognosis. The purpose of the present review is to discuss the role of PET/CT in the management of HNSCC and highlight the lack of well defined guidelines for surveillance strategies. **Study Design:** This is a review of the literature on the role of PET and PET/CT in the management of HNSCC. **Methods:** An English literature review was conducted using PubMed using the search terms: "PET" and "head and neck squamous cell cancer". Pertinent articles were selected and reviewed by the primary author. **Results:** Patients presenting with earlier stage tumors have excellent cure rates. In addition, treatment of early recurrence may improve survival, as it may be more amenable to surgical salvage, re-irradiation, and/or chemotherapy. The National Comprehensive Cancer Network (NCCN) guidelines for the treatment of HNSCC do not include the use of PET/CT and/or specify how to radiographically monitor patients after treatment. PET clearly has demonstrated some advantages over conventional imaging with CT and MRI, and PET/CT is even more superior. **Conclusions:** A survey of the literature has shown that PET and PET/CT have demonstrated an improved ability to detect tumor recurrence over conventional imaging modalities and probably should be integrated into HNSCC post-treatment surveillance protocols, because there is a survival benefit for salvage therapy in early over late recurrences.

E3. Surgical Management of an Unresectable Trigeminal Nerve (V2) Plexiform Neurofibroma: A Case Report

Urmen Desai, MD, Boston, MA
Elie E. Rebeiz, MD, Boston, MA
Arnold S. Lee, MD, Boston, MA
Richard O. Wein, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the infiltrative nature of plexiform neurofibromas and their association with neurofibromatosis type 1 (von Recklinghausen's disease); 2) appreciate the clinical assessment, radiologic presentation and histopathology findings seen in plexiform neurofibroma; and 3) recognize the clinical issues that present with surgical management of unresectable disease.

Objectives: Plexiform neurofibromas are slow growing, infiltrative tumors associated with type 1 neurofibromatosis (von Recklinghausen's disease). We present a case illustrating the complexity of surgical management seen with unresectable presentations and review the literature. **Study Design:** Case report. **Methods:** We present a case of a 9 year old male evaluated for a previously diagnosed plexiform neurofibroma presenting as a left midfacial mass with palatal involvement. The patient had developed worsening problems with oral competence, compromise in his ability to consume solids orally, nasal obstruction, and ptosis of the left lower eyelid. Preoperative imaging showed a poorly defined mass in the distribution of the second branch of the trigeminal nerve (V2) with extension into the hard and soft palate, soft tissues of the midface and entire nose, the pterygopalatine fossa, orbital apex, and foramen rotundum. **Results:** The patient underwent tumor debulking with infrastructure maxillectomy, a cervicofacial advancement flap and reconstruction to address the ptosis. He subsequently underwent additional procedures including endoscopic transnasal debulking and medial orbital decompression. The goal of each surgery was to preserve orbital function and restore the ability for maximal oral function. Histopathology showed a plexiform pattern of intertwined spindle shaped cells grouped in twisted cords surrounded by connective tissue fibers. Immunohistochemistry demonstrated tumor cells staining positive for S-100 and Mart-1. **Conclusions:** Although benign in nature, plexiform neurofibromas can be functionally debilitating. The management of unresectable disease is challenging but can provide functional benefit for selected patients when the goals of treatment are well defined.

E4. Diagnosis and Management of Cervical Schwannomas: Is Surgery Always Necessary?

Mona Gangar, MD, New York, NY
Thomas J. Ow, MD, New York, NY
Azita S. Khorsandi, MD, New York, NY
Mark S. Persky, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the clinical presentation and radiographic diagnostic criteria of cervical schwannomas as well as understand that observation may be an acceptable management of these lesions.

Objectives: To determine if clinical suspicion and radiographic characteristics are accurate for the diagnosis of cervical schwannomas, and to examine whether close observation rather than surgical excision is appropriate management for these lesions. **Study Design:** Retrospective chart review was performed on seven patients with a diagnosis of cervical schwannoma, and information including presenting signs and symptoms, size, location, radiographic appearance, management and length of followup was noted. **Methods:** Seven cases of cervical schwannomas, all initially treated with close observation, were reviewed retrospectively. **Results:** Lesions were located in the parapharyngeal space in five patients, the deep lobe of the parotid in one patient, and the upper jugular chain in one patient. All lesions were suspicious for cervical schwannomas based on MRI findings, and the diagnosis was confirmed on FNA or excisional biopsy in 4 of 7 patients. Four patients were observed for a mean average period of 1.4 years with no enlargement of the schwannoma. In three patients, eventual tumor enlargement necessitated intervention with a mean average time of 2.3 years. Two patients underwent surgical excision, and one patient underwent proton beam therapy. There were no complications with these interventions. **Conclusions:** Clinical history and radiographic findings on MRI can be sufficient for the diagnosis of cervical schwannomas. Our series also suggests that close observation may be appropriate initial management for cervical schwannomas. There is the potential benefit of avoiding unnecessary surgery and risk of injury to important neurovascular structures when dealing with a slow growing, benign tumor.

E5. Multinodular Goiter and Airway Compression in a Preeclamptic Patient: A Unique Management Dilemma

Heather J. Gomes, MD MPH, Boston, MA
Richard O. Wein, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to diagnose when multinodular goiter is causing airway compression, and discuss the options for management of this entity, particularly in the pregnant patient.

Objectives: To present a case of acute airway compression from goiter in a pregnant patient, discuss the management options, and review the literature regarding this diagnosis. **Study Design:** Case report and literature review. **Methods:** 1) Review of patient medical records; and 2) Medline search for medical literature pertinent to airway compression in the pregnant patient. **Results:** A 31 year old female presented at 33 weeks of pregnancy with preeclampsia, stridor while supine, and a midline neck mass. Computed tomography showed a markedly enlarged heterogeneous thyroid gland extending substernally with mass effect on the trachea. Given the urgency to deliver the infant and protect the mother's airway, a multidisciplinary team was assembled including obstetrics and gynecology, anesthesiology, otolaryngology, and cardiothoracic surgery. After prepping the patient for possible cardiopulmonary bypass, the infant was delivered under epidural anesthesia. Following delivery, the patient was fiberoptically intubated and a total thyroidectomy was performed to manage the acute airway compression. The patient had an uneventful postoperative course. **Conclusions:** Acute airway obstruction in the setting of complex pregnancy is a unique management dilemma. A multidisciplinary approach and careful planning was integral to the appropriate management of this patient. Preparing for potential difficulties can lead to successful results and avoid catastrophic outcomes.

E6.

Clear Cell Carcinoma of the Tonsil with Myoepithelial Features

Joel P. Jacobson, MD, New York, NY

Elana Opher, MD, New York, NY

Larry J. Shemen, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to review and discuss the differential diagnosis, pathological basis, and clinical management of a rare case of clear cell carcinoma.

Objectives: Clear cell carcinoma is a salivary gland neoplasm which has only recently been recognized as an independent entity, owing to the fact that many other salivary gland neoplasms can undergo clear cell change. The diagnosis is based on histopathologic and immunohistochemical features and can be difficult to fully characterize. Clinical management is also not well defined, and most cases are treated as a low grade salivary gland malignancy. Our objective is to present a case of clear cell carcinoma of the tonsil and review the diagnostic and clinical challenges involved in managing this rare tumor. **Study Design:** Case report. **Methods:** Review of patient chart, pathological specimen, and review of relevant literature. **Results:** The patient is a 70 year old woman who presented with a several month history of tonsillar mass without associated symptoms. On examination she had an obvious smooth mass filling her entire tonsillar fossa, without evidence for regional metastases. Limited incisional biopsy at an outside hospital had been performed and was consistent with mucoepidermoid carcinoma. She underwent radical tonsillectomy. Postoperative course was unremarkable and on followup there is no evidence of recurrent disease. Final pathology revealed a 3.5cm well demarcated, nonencapsulated, minimally infiltrative mass with negative surgical margins. Microscopy revealed clear cells that were stained positive for cytokeratin, alpha-1-antichymotrypsin, CK34, and negative for vimentin, alpha-1 antitrypsin, CD10, S100, GFAP, and smooth muscle actin. P63, a marker of myoepithelial cells, was positive. **Conclusions:** This tumor is a clear cell carcinoma with unique staining properties and may represent a common myoepithelial derivation. Treatment with radical excision and clear margins has been inferred as appropriate management, although close surveillance is necessary.

E7.

A Pilot Study to Evaluate the Use of the da Vinci Surgical Robotic System in Transoral Surgery for Lesions of the Oral Cavity and Pharynx

Scharukh M. Jalisi, MD, Boston, MA

Vartan A. Mardirossian, MD, Boston, MA (Presenter)

Alphi Elackattu, MD, Boston, MA

Mary C. Zoccolli, MD, Boston, MA

Gregory A. Grillone, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss the role of robotic surgery in the head and neck; 2) understand the advantages and disadvantages of robotic surgery; and 3) describe the appropriate candidate for robotic surgery.

Objectives: The aim study of this study is to evaluate the potential advantages of the da Vinci® Robotic Surgical System in Transoral Robotic Surgery (TORS) specifically looking at precision, dexterity, visualization and exposure of the surgical site, surgical time, recovery of speech and swallowing, degree of pain and incidence of bleeding. **Study Design:** Prospective clinical trial. **Methods:** 10 patients with lesions of the oral cavity and pharynx were recruited for this study. The following timing parameters were recorded: intraoperative setup time, surgical exposure, duration of surgery, days to swallowing and speech recovery. Additionally, the following were recorded: quality of surgical bed exposure, complications, pain intensity/duration, operative bleeding, postoperative bleeding, length of stay, tumor margin status. **Results:** All ten surgeries were performed between June 2007 and July 2008. The average intraoperative setup time was 26.4 minutes, it took an average of 68.5 seconds to obtain exposure of the tumor, the average robotic resection time was 46 minutes. While there were no intraoperative and postoperative complications, the speech and swallowing recovery did not exceed 2 days. There was minimal postoperative pain and resid-

ual bleeding and most patients were discharged home after 23 hour observation. **Conclusions:** The da Vinci® Robotic Surgical System is a safe and reliable instrument in transoral surgery for lesions of the oral cavity and pharynx. There is superior visualization and degree of freedom for resecting tumors, minimal time for speech and swallowing recovery after surgery, along with the reduced postoperative pain.

E8. Carcinoma Cuniculatum of the Oral Cavity—A Histological and Clinical Dilemma

Scharukh M. Jalisi, MD, Boston, MA
Monica S. Lee, MD, Boston, MA (Presenter)
Sarah S. Seo, MD, Boston, MA
Vartan A. Mardirossian, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the diagnostic features of carcinoma cuniculatum; 2) describe the treatment options for carcinoma cuniculatum; and 3) explain the differential diagnosis and diagnostic errors in carcinoma cuniculatum.

Objectives: To describe a rare case and explain the management options for carcinoma cuniculatum of the oral cavity. **Study Design:** Case report. **Methods:** Description of the diagnosis and management of a patient with carcinoma cuniculatum at a tertiary medical center. The pathological criteria for diagnosis are reviewed. **Results:** The patient is a 73 year old male who presented initially with a painful lesion involving the lateral right portion of his tongue in 2004. Multiple biopsies showed no cancer. He was finally referred to the head and neck surgery service and was diagnosed with squamous cell cancer. He underwent transoral robotic partial glossectomy and an ipsilateral modified radical neck dissection. The final pathology was carcinoma cuniculatum with all neck nodes negative for cancer. **Conclusions:** Carcinoma cuniculatum can present in an indolent manner, and biopsies can usually give a false diagnosis of benign lesion or pseudo-epithelial hyperplasia. Both clinical and histological features need to be considered in the accurate diagnosis of this cancer.

E9. Endoscopic Partial Laryngectomy with the CO2 Laser Fiber—Successful Management of Adult Laryngeal Rhabdomyoma

Scharukh M. Jalisi, MD, Boston, MA
Sarah S. Seo, MD, Boston, MA (Presenter)
Monica S. Lee, MD, Boston, MA
Vartan A. Mardirossian, MD, Boston, MA
Christie Morgan, BA, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) understand the epidemiology, presentation and management of laryngeal rhabdomyoma; 2) explain the pros and cons of endoscopic CO2 laser fiber resection of laryngeal tumors; and 3) review surgical techniques essential in successful endoscopic management of laryngeal rhabdomyoma.

Objectives: To describe a rare case of adult laryngeal rhabdomyoma and explain its surgical management via an endoscopic approach with the CO2 laser fiber. **Study Design:** Case report. **Methods:** Case report and literature review with video and photographic illustration of surgical technique utilizing CO2 laser fiber for successful endoscopic management of adult laryngeal rhabdomyoma. **Results:** Patient is a 60 year old male who was referred to our department with worsening hoarseness over the last 20 years. Initial panendoscopy and biopsy demonstrated laryngeal rhabdomyoma that was occupying the right hemilarynx with right arytenoid immobility. The patient underwent successful endoscopic vertical partial laryngectomy with the Omniguide® CO2 laser fiber. The patient did not need a tracheostomy and was tolerating a regular diet on postoperative day 2 and had an adequate voice. Surveillance MRIs have shown no recurrence of disease. **Conclusions:** Adult laryngeal rhabdomyoma is a rare entity that is typically managed by an open laryngeal procedure for large tumors. These can now be successfully managed with excellent results using the latest transoral endoscopic techniques and the utilization of the CO2 laser fiber.

E10. Case Report of Patient with Neck Mass Diagnosed as Syphilitic Lymphadenitis via Fine Needle Aspiration Biopsy

David W. Jang, MD, New York, NY
Alifia Khan, MD, New York, NY
Eric M. Genden, MD, New York, NY*
Maixin Wu, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the manifestations,

diagnosis, and treatment of syphilitic lymphadenitis.

Objectives: To describe a rare case of syphilitic lymphadenitis diagnosed via fine needle aspiration biopsy (FNAB). To discuss the head and neck manifestations of syphilis, along with the associated diagnostic and treatment strategies. **Study Design:** Case report. **Methods:** The patient's chart was reviewed. The pertinent history, clinical course, and ancillary studies, including FNAB cytology and special stains for identifying spirochetes, are presented. **Results:** This was a 37 year old man presenting with a two month history of a growing neck mass, night sweats, and a ten pound weight loss. The patient had been treated one month earlier for primary syphilis. Examination of the head and neck revealed a 3 cm right level II mass. FNAB cytology showed follicular hyperplasia, and silver stain of the smear revealed spirochetes, consistent with secondary syphilis. The patient's lymphadenitis resolved with a course of antibiotics. In addition to the case report, we discuss the head and neck manifestations of syphilis. **Conclusions:** Although malignancy must be ruled out in adult patients who present with neck masses, one should consider a variety of infectious agents, particularly in patients who offer a suspect history.

E11. Granulocytic Sarcoma of the Submandibular Gland

David H. Jung, MD PhD, Boston, MA
Robert P. Hasserjian, MD, Boston, MA
William C. Faquin, MD PhD, Boston, MA
Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe key features of GS distinguishing GS from other submandibular gland masses.

Objectives: 1) To describe the diagnosis and treatment of granulocytic sarcoma presenting in a submandibular gland; and 2) to identify granulocytic sarcoma as a rare but important diagnosis to be considered in patients presenting with a submandibular gland mass. **Study Design:** The study is a case report and review of the literature. **Methods:** The patient data relevant to the case were reviewed. An extensive literature search was carried out using the PubMed NIH database. **Results:** Granulocytic sarcoma (GS) is an extramedullary presentation of acute myelogenous leukemia. In the head and neck, GS has previously been reported in lymph nodes, tonsils, and the oral cavity; however, it has not been previously reported in a salivary gland. A young woman, with medical history significant for radiation exposure at a young age, presented with a submandibular gland mass. Excision of the mass and subsequent analysis revealed the presence of a GS subtype within the mass. The rapid diagnosis of GS allowed for timely treatment of this patient, and the patient remains disease free more than one year later. **Conclusions:** Early diagnosis of GS is important for both staging and treatment. It may therefore be important to entertain the relatively rare diagnosis of GS within the broader differential diagnosis of salivary gland tumors, especially in patients with previous radiation exposure. Understanding the mechanisms by which GS can present as a salivary gland mass may eventually shed light on general principles determining tumorigenesis within salivary glands.

E12. Radial Forearm Free Flap Reconstruction of a Nasopharyngeal Defect Secondary to Cervical Osteoradionecrosis

Kiran Kakarala, MD, Boston, MA
Jeremy D. Richmon, MD, Boston, MA
Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the reconstruction of a nasopharyngeal soft tissue defect caused by cervical osteoradionecrosis.

Objectives: 1) Present a case of cervical spine osteoradionecrosis and nasopharyngeal defect which was reconstructed with a radial forearm free flap; and 2) review the literature on the management and reconstruction of cervical spine osteoradionecrosis. **Study Design:** Case report. **Methods:** Retrospective case review including a review of the relevant literature. **Results:** The case of a 57 year old man with osteoradionecrosis of the cervical spine is presented. He had previously undergone surgery and proton beam radiation for hepatocellular carcinoma metastatic to the C2 body, and subsequently developed osteoradionecrosis and osteomyelitis of the cervical spine. Biopsy of the area was negative for tumor recurrence. Treatment with hyperbaric oxygen and intravenous antibiotics was unsuccessful. Operative debridement of the necrotic bone was therefore performed, and the nasopharyngeal soft tissue defect was reconstructed with a radial forearm free flap. At 3 months followup he was doing well with normal swallow function. **Conclusions:** Osteoradionecrosis of the cervical spine is an uncommon complication of radiation treatment of head and neck tumors. Management with hyperbaric oxygen therapy and intravenous antibiotics for associated osteomyelitis has been described, however, operative management may be required. The use of the fibula osteocutaneous free flap has been described for reconstruction of both bony and composite defects related to cervical spine osteoradionecrosis. For patients where bone is not required, the radial forearm free flap provides thin, pliable soft tissue which is advantageous in pharyngeal reconstruction.

E13. Low Grade Salivary Gland Neoplasm of the Tongue Base: A Case Study

Stephen J. Kraseman, MD, Danville, PA
Thomas L. Kennedy, MD*, Danville, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain concepts of management for neoplasms of the minor salivary glands in the tongue.

Objectives: Identify minor salivary gland neoplasms of the tongue and explain concepts of management for neoplasms of the minor salivary glands in the tongue. **Study Design:** Case report. **Methods:** Case review. **Results:** A 53 year old female presented to our otolaryngology clinic with a 7 week history of tongue ulceration and edema. Clinically, the mass was rubbery, mucosally covered, and occupied about 60-70% of the tongue base. Magnetic resonance imaging revealed a well circumscribed, heterogeneously enhancing mass in the right posterior tongue base measuring 4.5 x 3.4 x 3.9 cm. Immunohistochemistry studies of a biopsy were positive for cytokeratin and S-100, confirming a myoepithelial lineage, and a MIB1 (Ki-67) stain demonstrating a low proliferative rate. On surgical excision the mass measured 4.8 x 4.2 x 3.6 cm and grossly appeared benign. Microscopically, the tumor was comprised mostly of round, hyperchromatic cells with ill defined pink cytoplasm and multiple dilated cyst-like spaces filled with proteinaceous material. Immunohistochemistry showed focal S-100 positivity, weakly positive smooth muscle actin, and positive keratin, features felt to be most consistent with an epithelial-myoeplithelial carcinoma (EMC). Review by the Armed Forces Institute of Pathology was consistent with a low grade salivary gland tumor, likely a myoepithelial neoplasm versus an ectomesenchymal chondromyxoid tumor. No adjuvant radiation was administered, and close followup with annual MRI scans for the past 3 years has failed to show evidence of recurrence. **Conclusions:** Primary surgical excision with close clinical followup should be the treatment of choice for malignant minor salivary gland tumors of the tongue base.

E14. Using Fluoroscopy and FEES to Manage Dysphagia after Head and Neck Cancer

Susan E. Langmore, PhD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the two standard tools for visualizing swallowing in terms of indications, findings, and benefits.

Objectives: To determine indications, unique findings, and most effective ways to use fluoroscopy and FEES when evaluating and treating dysphagia in H&N cancer patients. To use recorded case studies to illustrate the use of both tools. To use evidence based research as possible to support the author's opinion. **Study Design:** Retrospective cohort and case studies; expert opinion. **Methods:** Retrospective review of recorded studies and written reports over the past 3 years were undertaken where fluoroscopy and FEES were utilized to evaluate and treat patients with dysphagia. Compilation of these records and recorded studies yielded indications, unique findings, strengths and weaknesses, and uses of each procedure. **Results:** Indications for each examination included particular structures to be visualized and the indications for the examination (eg., suspected UES stricture vs. teaching a swallow maneuver). Unique findings of each exam included visualization of different anatomical structures, different structural movements, presence of secretions, sensory awareness, and localization of the bolus. Guidelines for choosing one or the other tool were able to be developed. **Conclusions:** Patients with head and neck cancer, perhaps more than any other patient group, benefit from the combined use of these two examinations. There were multiple examples where one exam provided critical information that had not been visualized by the other exam. The author concluded that the two examinations complement each other and when used together, give the clinician a superior advantage.

E15. The Missing Tracheoesophageal Puncture Prosthesis: Evaluation and Management

Shelby C. Leuin, MD, Boston, MA
Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should understand the use of the tracheoesophageal puncture prosthesis for post-laryngectomy voice rehabilitation and be familiar with key steps in the management of a dislodged prosthesis.

Objectives: Review the evaluation and management of the patient with a lost tracheoesophageal voice prosthesis. **Study Design:** Case presentation and review of the literature. **Methods:** After description of the pertinent case, the literature review will focus on tracheoesophageal voice restoration in the post-laryngectomy patient as well as complications associated with the tracheoesophageal puncture prosthesis. These include granuloma formation, fungal infection of the prosthesis, salivary leakage around the valve, puncture site migration, and aspiration of the prosthesis. The missing voice prosthesis represents a rare but significant event for the patient having undergone surgical voice restoration. **Results:** The patient presented with a dis-

lodged prosthesis. Appropriate workup and relevant images are presented. The missing prosthesis was identified in the gastrointestinal tract and a new Blom-Singer prosthesis was placed without complication. **Conclusions:** In the case of a patient with a missing tracheoesophageal puncture prosthesis, a thorough evaluation of the tracheobronchial tree should be performed. Once the pulmonary system is cleared, the prosthesis should be presumed to be in the gastrointestinal tract and can be allowed to pass. A new prosthesis or catheter should be placed in the fistula tract to prevent aspiration.

E16. Bilateral Cavernous Sinus Invasion through Perineural Spread of Inverted Papilloma

Fred Y. Lin, MD, New York, NY

Chan W. Park, MD, New York, NY (Presenter)

Christine Mounq, MD, New York, NY

Peter M. Som, MD, New York, NY

William L. Lawson, DDS MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the possibility of cavernous sinus extension of highly aggressive recurrent inverted papillomas.

Objectives: To report the first case of bilateral cavernous sinus invasion through perineural spread of a recurrent inverted papilloma. **Study Design:** Case report. **Methods:** We report a case of a 53 year old female who initially presented with epistaxis 15 years ago and was found to have an inverted papilloma. After surgical resection, the patient developed multiple recurrences, all surgically resected, and most recently developed paresthesia in the left V2 distribution and diplopia in the left eye with imaging showing a soft tissue mass in the left posterior maxillary sinus and fullness in V2. The patient returned to the operating room where the maxillary sinus was positive for recurrent IP and perineural invasion was found of the infraorbital nerve. A followup MRI several months later showed fullness in both cavernous sinuses extending down to the second and third divisions of the trigeminal nerve. **Results:** Imaging with MRI and PET/CT showed bilateral cavernous sinus invasion through perineural spread of this patient's inverted papilloma. **Conclusions:** We propose that in aggressive forms, perineural spread can occur in inverted papillomas. To our knowledge, this is the first reported case of an inverted papilloma invading the cavernous sinuses via perineural spread. We also believe that additional investigations are required to characterize the pathophysiology involved in inverted papilloma perineural spread.

E17. Work Type II First Branchial Cleft Cyst with External Auditory Canal Duplication

Sandy Mong, BS, Boston, MA

Anthony Nichols, MD, Boston, MA

Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation about work type II first branchial cleft anomalies, the participants should be able to explain the challenges facing its diagnosis, its anatomical variations, and the factors contributing to risk of facial nerve injury and recurrence; as well as discuss a strategy to reduce postoperative morbidity.

Objectives: The objective is to describe a case of work type II first branchial cleft cyst (BCC) with external auditory canal (EAC) duplication, and review its diagnosis, management and treatment complications. **Study Design:** Case report. **Methods:** Medical record and literature review. **Results:** A 25 year old male presented with a tender, fixed 3-cm right parotid mass persisting over 2 years with recent interval enlargement. CT scan demonstrated a cystic mass that did not invade adjacent soft tissue or bone. Fine needle aspiration (FNA) yielded cyst fluid. Total parotidectomy with facial nerve dissection for a presumed parotid tumor demonstrated a mass tracking deep to the facial nerve, coursing medially and superiorly to terminate adjacent to the cartilaginous EAC. Pathology revealed an epithelial lined cyst with hair matrix surrounded by elastic cartilage in focal areas. This case supports the literature in demonstrating that: 1) misdiagnosis occurs commonly and frequently necessitates revision; 2) full facial nerve dissection reduces incidence of its injury; and 3) increased familiarity with its clinical symptoms, inclusion on the differential for parotid masses, preoperative imaging, and identification of tract in the specimen can reduce recurrence rates. **Conclusions:** Work type II first branchial cleft anomalies must be included in the differential diagnosis for head and neck masses above the level of the hyoid bone. Preoperative imaging, more so than FNA, can confirm the diagnosis. Improved diagnosis can ensure the appropriate surgical approach, and thus decrease the risk of postoperative complications.

E18. Ameloblastic Carcinoma of the Mandible Metastatic to Skull

Christie L. Morgan, MS, Boston, MA

Jeffrey H. Spiegel, MD, Boston, MA

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

tations of the rare tumor, ameloblastic carcinoma of the mandible, and describe its metastatic patterns.

Objectives: We report a very rare case of ameloblastic carcinoma of the mandible in a 16 year old boy, that 4 years after definitive treatment presented with metastasis into the anterior skull. **Study Design:** Case report. **Methods:** We review the presenting history, management, and presentation of a very rare tumor with an unusual metastatic pattern. **Results:** There are few reported cases of ameloblastic carcinoma of the mandible. Metastases, when present, have most often been reported in the lung. We report the very rare case of a patient with ameloblastic carcinoma of the mandible metastatic to the anterior skull. **Conclusions:** Metastatic ameloblastic carcinoma of the mandible to the skull is an important clinical case. Prior publications on ameloblastic carcinoma have encouraged continued reporting of this disorder as relatively little is known about the clinical nature of the tumor. We contribute a rare case of bony metastasis to the anterior skull.

E19. Cavernous Hemangioma of the Carotid Sheath

Luc G.T. Morris, MD, New York, NY
Jonathan Zagzag, BS, New York, NY
Mark D. DeLacure, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to outline the differential diagnosis of a carotid space mass, describe imaging characteristics of each, and describe relevant differences in capillary and cavernous hemangiomas as they relate to uncommon tumors of the head and neck.

Objectives: To describe the first reported case of a hemangioma presenting within the carotid sheath, and describe the differential diagnosis of tumors arising in this space. **Study Design:** Case report and literature review. **Methods:** The records of a patient presenting with a carotid space mass which was ultimately found to be a cavernous hemangioma were reviewed, as well as relevant literature. **Results:** A 64 year old man was found to have a right neck mass, with CT imaging demonstrating a 6cm tumor arising within the carotid space. Intraoperatively the mass was noted to not be continuous with neural or vascular structures. Final pathology revealed a cavernous hemangioma. **Conclusions:** We report the first case of cavernous hemangioma arising within the carotid sheath. Relevant aspects of the diagnosis of a carotid space mass will be discussed, as well as specifics of capillary and cavernous hemangioma pathophysiology.

E20. Diffuse Large B-Cell Lymphoma Presenting as a Deep space Neck Infection and Esophageal Perforation

Thomas J. Ow, MD, Bronx, NY
Adam S. Jacobson, MD, New York City, NY
Azita S. Khorsandi, MD, New York City, NY
Mark L. Urken, MD, New York City, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize that large B-cell lymphoma can masquerade as a deep neck space infection, and suspicion for this entity should be high when there is disruption of the esophagus in the setting of a large neck mass.

Objectives: To discuss a rare case in which diffuse large B-cell lymphoma presented in a patient with a large neck mass and perforation of the esophagus. **Study Design:** Case report and review of the literature. **Methods:** Lymphoma involves the esophagus in 1% of cases. Violation of the esophageal wall is rare. We report a case of diffuse large B-cell lymphoma masquerading as a deep neck abscess with erosion into the cervical esophagus. A review of the literature follows. **Results:** A 56 year old woman presented with a right-sided neck mass that had arisen over a period of four months. CT scan yielded a large, heterogenous mass involving the parapharyngeal and retroesophageal spaces with free air noted to track within the mass. The patient underwent a tracheotomy and open biopsy revealing purulent fluid at the core of the mass. There was copious drainage from the patient's neck wound for several days. A methylene blue swallow test confirmed our suspicion for a fistula when blue dye drained from her wound. Pathologic review of the initial specimen was inconclusive, so an ultrasound guided fine needle aspiration of an enlarged submandibular lymph node was performed. Results were consistent with diffuse large B-cell lymphoma. The patient subsequently received chemotherapy treatment for her disease with a complete response and closure of her cervical esophageal fistula. **Conclusions:** There are few reports in the literature describing the development of tracheoesophageal fistula in the setting of cervical lymphoma and one case presenting with perforation of the esophagus. When patients present with a neck mass and perforation of the cervical esophagus, diffuse large B-cell lymphoma should be a high consideration on the differential diagnosis.

E21. Paraneoplastic Anti-Hu Neuronopathy Secondary to a Myxoid Chondrosarcoma in the Head and Neck Region

Thomas J. Ow, MD, Bronx, NY
Adam S. Jacobson, MD, New York City, NY

Irene R. Boniece, MD, New York City, NY
Bruce M. Wenig, MD, New York City, NY
Azita S. Khorsandi, MD, New York City, NY
Mark L. Urken, MD, New York City, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to understand anti-Hu neuropathy and explain the importance of this diagnosis as a potential paraneoplastic syndrome in the setting of head and neck malignancy.

Objectives: To describe a rare case of anti-Hu neuropathy arising in a patient with a myxoid chondrosarcoma of the left neck. This rare paraneoplastic syndrome and sarcomatous lesion will be discussed and the literature will be reviewed. **Study Design:** Case report and review of the literature. **Methods:** It is rare for paraneoplastic syndromes to occur in patients with head and neck cancer, especially those involving the nervous system. In the current report, we describe a patient with a myxoid chondrosarcoma arising in the left supraclavicular region who developed anti-Hu antibody associated sensorimotor neuropathy. A review of the literature follows. **Results:** A 40 year old man presented with a left supraclavicular mass. The patient developed progressive numbness of his arms, legs and trunk three weeks previous to his initial presentation. Physical examination and electromyography/nerve conduction velocity studies revealed a sensorimotor polyneuropathy. He tested positive for serum anti-Hu antibodies. The patient underwent a left neck dissection including resection of the supraclavicular mass, which proved to be a myxoid chondrosarcoma with metastases to several cervical lymph nodes. The tumor stained diffusely with anti-Hu antibodies. Since surgery, the patient has received adjuvant radiation therapy, as well as intravenous immunoglobulin and tacrolimus, with slow improvement of his neurologic symptoms. **Conclusions:** Anti-Hu neuropathy has been described previously in one case of head and neck squamous cell cancer, and it has only been reported in association with three sarcomatous lesions from various sites. Our case represents the first report of anti-Hu neuropathy secondary to a sarcomatous lesion primary to the head and neck. When sensorimotor deficits are elicited on history and physical in the presence of a head and neck malignancy, anti-Hu neuropathy should be considered in the differential diagnosis.

E22. Solitary Extramedullary Plasmacytoma of the Anterior Skull Base Presenting with Seizures: A Case Report

Anish Y. Parekh, MD, Boston, MA
Jagdish K. Dhingra, MD, Norwood, MA
Monika E. Pilichowska, MD PhD, Boston, MA
Elie E. Rebeiz, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, participants should be able to discuss the differential diagnosis of a septal mass, the classification of plasmacytomas, and treatment strategies of plasmacytomas in the nasal septum and anterior skull base.

Objectives: The objective of this case report is to discuss a plasmacytoma, a rare neoplasm of the head and neck, which presented with seizures and a septal mass extending to the anterior skull base and to review its histopathology and treatment strategies. **Study Design:** The study design consists of a case presentation and review of literature pertaining to plasmacytomas of the head and neck. **Methods:** The methods of this study include review of the patient's medical record, imaging studies, and surgical pathology. A review of the literature is performed using PubMed, a service of the U.S. National Library of Medicine. **Results:** Plasmacytomas are rare neoplasms of the head and neck. They are classified as medullary or extramedullary and solitary or multiple. We present a 48 year old female patient with a 2 year history of nasal septal mass. She suffered a new onset seizure at home. Subsequent CT imaging revealed a solitary extramedullary soft tissue mass involving the nasal septum, anterior superior ethmoid air cells with extension to the frontal bulla, anterior maxilla, medial left orbital floor, and cribriform plate. A biopsy of the lesion was taken and immunohistochemical study showed plasma cell infiltrate staining positive for CD138, CD56, and MUM1 confirming plasmacytoma. The treatment plan chosen for this patient consists of radiotherapy. **Conclusions:** Plasmacytomas are a rare neoplasm of the head and neck but should be included in the differential diagnosis of nasal septum mass. Treatment of these lesions includes radiotherapy with or without surgical excision.

E23. Cutaneous Angiosarcoma of the Forehead with Parotid and Pulmonary Metastasis: A Therapeutic Challenge

Tejas H. Raval, MD, Boston, MA
Richard O. Wein, MD, Boston, MA
Elie E. Rebeiz, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the presentation of head and neck cutaneous angiosarcoma, methods of diagnosis and treatment, and management of treatment failure.

Objectives: To present a case of cutaneous angiosarcoma of the head and neck with development of parotid and pulmonary metastasis during chemoradiation treatment. A review of the literature and discussion regarding diagnosis and treatment of head and neck cutaneous angiosarcoma is presented. **Study Design:** Case report and literature review. **Methods:** 1) Review of patient medical records; and 2) Medline search for medical literature pertinent to head and neck cutaneous angiosarcoma. **Results:** This patient presented with periorbital ecchymosis initially diagnosed as a hematoma. Due to its persistence, this area was biopsied and was consistent with angiosarcoma. Chemoradiation treatment was initiated. Satisfactory response was noted at the primary site, but suspicious lesions in the left parotid and right lung developed during treatment. Left parotidectomy and right lower lobe wedge resection confirmed metastatic disease. The patient was offered palliative chemotherapy. **Conclusions:** Cutaneous angiosarcoma is a rare, but aggressive lesion of the head and neck. Cases with extensive local disease and distant metastasis are a therapeutic challenge. Surgery, radiation, and chemotherapy all have a potential role in treatment. Local and distant treatment failure is common.

E24. Comparison of Efficacy, Safety, and Cost Effectiveness of In-Office Cup Forceps Biopsies versus Operating Room Biopsies for Laryngopharyngeal Tumors

Arang Samim, MD, Boston, MA
Harini Naidu, BS, Boston, MA (Presenter)
Jacob P. Noordzij, MD, Boston, MA*
Scharukh Jalisi, MD, Boston, MA
Gregory A. Grillone, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the efficacy and cost effectiveness of in-office laryngopharyngeal biopsy versus operative biopsies.

Objectives: To compare the diagnostic yield, safety and cost between biopsies of laryngopharyngeal tumor performed in an office setting with those performed in the operating room under general anesthesia. **Study Design:** This was a retrospective review of patients' records at our institution during the time period of 2006-2008. **Methods:** In-office biopsies were performed using flexible digital videolaryngoscopy with cup forceps biopsies taken via the working channel in patients in whom cancer was strongly suspected. Patients, whose in-office biopsies were nondiagnostic or suspected to be falsely negative, were taken to the operating room for biopsy under general anesthesia and served as the control group. **Results:** 13 patients fit the selection criteria and had in-office biopsies attempted. One patient could not tolerate the in-office biopsy. Eight of the 12 in-office biopsies performed were diagnostic for squamous cell carcinoma. The average cost (facility and professional otolaryngology charges) for an in-office biopsy was \$2053.91. Five of these patients required further biopsy in the OR at an average cost (charges for surgeon, operating room, anesthesia and recovery room) of \$9024.47. There were no significant complications reported in any of the procedures. **Conclusions:** In patients with strongly suspected laryngopharyngeal cancer, in-office cup forceps biopsies were 66% diagnostic. When compared to the operating room, in-office cup biopsies of laryngopharyngeal tumor are as safe and considerably more cost effective. Although 1/3 of patients required repeat biopsy in the operating room, the cost would have been double in this cohort if all patients had gone to the operating room for biopsies.

E25. Missing Neck Nodes

Ashok R. Shaha, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the issues related to management of neck nodes in thyroid cancer; that node localization may be a difficult problem and metastatic nodes can be missed during neck dissection.

Objectives: Management of metastatic neck nodes from thyroid cancer has become a complex subject, especially with thyroglobulin assay, ultrasound, and needle biopsy. The incidence of nodal metastasis in papillary carcinoma ranges from 40-50%, so it is not uncommon to see a patient returning with neck node metastasis. **Study Design:** Localization of these nodes may be difficult. An index node might not be identified during surgery, but will be recognized at a later date with imaging studies. Recently we have undertaken a large number of neck dissections for metastatic papillary thyroid carcinoma. **Methods:** In two patients the surgical exploration and appropriate neck dissection did not reveal the metastatic neck node in the final pathology report. The subsequent imaging study revealed persistent abnormality akin to preoperative evaluation in one patient. **Results:** Several neck nodes were removed in both neck dissections. However, in one patient there was no identification of an index neck node in the specimen. In the other patient, stable neck nodes were recognized during the followup ultrasound. Clearly, this represents an entity yet to be defined as "missing neck nodes". These missed neck nodes may create considerable confusion and concern amongst patients. **Conclusions:** Appropriate presurgical evaluation of the localization studies and intraoperative assistance either with sestamibi, radioactive iodine, or ultrasound guided needle localization may be helpful. The role of intraoperative ultrasound remains undefined at this time. It is quite likely we will see more of this entity of missing neck nodes as our experience increases in this field.

E26. The Role of Fine Needle Aspiration Biopsy in a Recurrent Inflammatory Myofibroblastic Pseudotumor of Maxillary Sinus

Jeffrey D. Sharon, MS4, New York, NY
Eric M. Genden, MD*, New York, NY
Maixin Wu, MD PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to learn more about the possible role for fine needle aspiration in the evaluation of inflammatory myofibroblastic pseudotumor.

Objectives: Inflammatory myofibroblastic pseudotumor (IMT) is a rare disease entity characterized by a proliferation of fibroblasts, myofibroblasts, lymphocytes, plasma cells, and histiocytes. Although this is not a malignant tumor at cytomorphological level, its complexity in differential diagnoses and a tendency for recurrence creates challenges in clinical management, especially in the head and neck region. We wish to suggest that fine needle aspiration biopsy (FNAB) can play an important role in the diagnosis and management of IMTs. **Study Design:** Reported here is a case of a recurrent IMT of the maxillary sinus with a complex clinical course. **Methods:** We used hospital archives and interviews to construct the case report, and a PubMed search to present the data on the role of FNAB in IMTs. **Results:** We present the data on the utility of FNAB along with previous surgical biopsies with immunohistochemical in diagnosing and monitoring IMTs, as well as a detailed discussion of the cytopathological findings and our strategies of clinical management in this patient. **Conclusions:** The findings indicate that FNAB is a valuable tool in monitoring such a patient.

E27. High Grade Lymphoma Mimicking Advanced Nasopharyngeal Carcinoma

Amanda L. Silver, MD, Boston, MA
Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to develop a management approach to a rapidly progressive skull base mass with cervical metastases allowing timely and proper diagnosis of the less common high grade lymphoma.

Objectives: Although nasopharyngeal carcinoma represents the most common malignancy of the nasopharynx and central skull base, the differential diagnosis should be broad. This report will identify and highlight key factors in differentiating rare aggressive lymphoma in patients with an aggressive nasopharyngeal mass eroding the skull base and extensive neck metastases. **Study Design:** Case report. **Methods:** A 58 year old male presented with a 4-5 week history of an expanding left neck mass with associated neurologic symptoms. Initial symptoms were left-sided otalgia and sore throat that progressed to left-sided facial numbness, hoarseness and a rapidly expanding left-sided neck mass which measured 6 by 8cm in the mid-jugular chain. He then developed left eye ptosis and diplopia. An outside FNA of the cervical lymph node was nondiagnostic. CT and MRI demonstrated a left nasopharyngeal mass with extensive involvement of the sphenoid sinus, clivus, skull base and extension into the left cavernous sinus, left pterygopalatine fossa, Meckel's cave, foramen rotundum and ovale. He underwent uncomplicated transnasal endoscopic biopsy of the nasopharyngeal mass. This revealed diffuse large B-cell lymphoma and chemotherapy was initiated within 72 hours of his diagnostic procedure. **Results:** N/A. **Conclusions:** A rapid clinical course with progressive cranial neuropathies should raise the consideration of a high grade lymphoma. Workup must include timely and adequate tissue acquisition. Tissue should be sent fresh to pathology for appropriate typing. Although FNA of a cervical metastasis or open neck biopsy can be helpful, endoscopic transnasal biopsy provides excellent access to the primary lesion for safe and effective biopsy and diagnosis.

E28. Hepatocellular Carcinoma Presenting as an Obstructive and Hemorrhagic Tonsillar Mass

Aaron M. Wieland, MD, Boston, MA
Andrew R. Scott, MD, Boston, MA
Julia A. Turbiner, MD, Boston, MA
Ramon A. Franco, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the unique pathology of this hemorrhagic oropharyngeal mass.

Objectives: Metastatic carcinoma of the palatine tonsil is rare. We report an unusual case of a hepatocellular carcinoma that presented clinically as a bleeding tonsillar mass. **Study Design:** A case report and review of the literature. **Methods:** Case report and Medline search of the terms "tonsillar mass" and "metastasis". **Results:** An 85 year old male presented to the emergency department with a chief complaint of hemoptysis and globus. A pedunculated mass of the left tonsil was bleeding and nearly obstructing the oropharynx. He was seen by an otolaryngologist two months earlier for oral bleeding, and granulation

tissue at the left tonsil was cauterized with silver nitrate. The patient's past medical history was significant for coronary artery disease, Parkinson's, diabetes, transient ischemic attacks for which he was on Coumadin and tonsillectomy as a child. After resuscitation and reversal of anticoagulation the patient was taken to the OR where a 2.5 by 2.5 by 1.5 cm pedunculated mass emanating from the left superior pole of the tonsillar fossa was removed transorally. Pathology was consistent with metastatic hepatocellular carcinoma. Subsequent imaging of the abdomen revealed multiple enhancing lesions of the right lobe of the liver. Serum alpha fetoprotein was markedly elevated at 1787 ng/ml. There have been eight prior reported cases of HCC metastatic to the palatine tonsil. This is the third reported case where bleeding was the initial symptom. **Conclusions:** Metastatic carcinoma of the palatine tonsil is rare. The prognosis of patients with hepatocellular carcinoma metastatic to the head and neck is poor and treatment goals should focus on palliation of local symptoms.

Laryngology-Bronchoesophagology

E29. Symptomatic Relief of Zenker's Diverticulum with Botulinum Toxin Injections of the Cricopharyngeus

Shifali Arora, MD, Durham, NC

Jason D. Bloom, MD, Philadelphia, PA

Natasha Mirza, MD, Philadelphia, PA*

Gregory S. Weinstein, MD, Philadelphia, PA*

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) discuss additional nonsurgical techniques for Zenker's diverticulum treatment; and 2) understand the effect of direct botulinum toxin injections on Zenker's diverticulum.

Objectives: Zenker's diverticulum is a diagnosis that primarily affects individuals in the seventh and eighth decades and can lead to symptoms of dysphagia, aspiration, and regurgitation. The current mainstay of treatment is surgical. Due to the advanced age of the population largely effected by this diagnosis, many are not prime surgical candidates and have a higher probability of sequelae from general anesthetics. Botulinum toxin is a newer treatment option being explored as it causes a dose dependant weakness in the cricopharyngeus muscle. The index case is a patient with a history of a recurrent Zenker's diverticulum despite multiple endoscopic resections, who was given serial botulinum toxin injections bilaterally for the purpose of studying subjective symptom improvement. **Study Design:** Case report from a tertiary care medical center. **Methods:** This is a case report of one patient with a recurrent Zenker's diverticulum who was seen in the clinic of the outpatient voice and swallowing center. The patient was given 2.5 units of botulinum toxin into the cricopharyngeus muscle under EMG guidance in the clinic during the first visit. The patient was followed for four months to look for continued subjective symptom reduction. **Results:** The patient's symptoms improved five days after the first set of injections and continued to improve with subsequent injections. The patient's original complaints of dysphagia and regurgitation resolved after the injections. **Conclusions:** This noninvasive treatment option should be considered for the subset population with a small or recurrent Zenker's or those who are poor surgical candidates.

E30. Iatrogenic Unilateral Vocal Fold Paralysis after Radiofrequency Lesioning for Cervical Facet Joint Denervation

Nina Chinosornvatana, MD, New York, NY

Chih-Kwang Sung, MD MS, New York, NY

Mark A. Sivak, MD, New York, NY

Peak Woo, MD, New York, NY*

Educational Objective: At the end of this presentation, the participants should be able to recognize a rare, but possible, complication of radiofrequency lesioning.

Objectives: Radiofrequency lesioning is the use of fluoroscopically guided radiofrequency thermocoagulation for facet joint denervation as treatment of facet disease and pain. It is an outpatient procedure that has been used since 1974. We report a previously undescribed injury to the vagus nerve after such treatment. **Study Design:** Case report. **Methods:** A 62 year old female with right C3-C4 cervical facet joint disease underwent denervation by fluoroscopically controlled placement of radiofrequency probe under general anesthesia in October of 2007. She awoke with neck swelling and hoarse voice. Aphonia persisted through the first 3 months and gradually improved. She was evaluated for the etiology of her hoarseness. **Results:** On initial evaluation, she had moderate dysphonia with a phonation time of 6.5 seconds. A dense right vocal fold paralysis was noted. Her voice handicap index (VHI) was 42. Examination performed 10 months after the injury continued to show right vocal fold immobility and clinical evidence of vocal fold paralysis. Laryngeal electromyography showed both a right superior laryngeal paresis and a right recurrent laryngeal nerve paresis with polyphasic units, nascent units and reduced recruitment. The contralateral side was normal. This is indicative of partial vagal injury. The placement of the radiofrequency probe near the cervical facet C3-C4 was probably responsible for the partial vagus nerve injury. **Conclusions:** Iatrogenic injury to the vagus nerve is

a possible complication of radiofrequency lesioning of the spine.

E31. Laryngeal Mask Airway in Laryngoscopies: A Safer Alternative for the Difficult Airway

Nazish K. Hashmi, MD, Philadelphia, PA
Jeff E. Mandel, MS MD, Philadelphia, PA
Natasha Mirza, MD, Philadelphia, PA*

Educational Objective: At the conclusion of this presentation, the participants should be able to identify clinical conditions that could result in a difficult airway in patients with vocal cord and upper tracheal lesions, discuss the advantages of LMA, limitations of LMA use.

Objectives: To identify patients with potentially difficult airways, and to determine the benefits and risks of ventilating such patients during laryngeal or upper tracheal procedures using a laryngeal mask airway (LMA). **Study Design:** The study is a retrospective chart review. **Methods:** The computer records of the anesthesia department over the last six months were used to identify all patients who have been ventilated using an LMA due to a difficult airway. This procedure was used for bronchoscopies, laryngoscopies, laser treatments and biopsies of laryngeal and upper tracheal lesions. The clinic charts and postoperative notes of these patients were used to record demographic data, body mass index, diagnosed medical disorders, reason for classification as a difficult airway, emergent or elective use of LMA to ventilate and postoperative morbidity due to LMA use. **Results:** We identified 4 cases of difficult airway in the last six months. Laryngeal pathologies included leukoplakia, hemangioma and laryngotracheal stenosis. Each patient underwent an elective LMA insertion because these patients were predicted to have a difficult airway. Laryngeal surgeries were performed uneventfully with good results. There were no intraoperative or postoperative complications in any patient. **Conclusions:** In patients with difficult airways, it is safer and easier to insert a laryngeal mask airway compared to an endotracheal tube. The lesions are easy to visualize, there is minimal vocal cord trauma and it serves as a wide conduit for bronchoscopes and laryngoscopes. We recommend preoperative identification of difficult airways and elective LMA use during such procedures.

E32. Management of Laryngeal Fractures: A Ten Year Experience

Scharukh M. Jalisi, MD, Boston, MA
Mary C. Zoccoli, MD, Boston, MA (Presenter)
Vartan A. Mardirossian, MD, Boston, MA
Leslie Winter, MD, Boston, MA
Monica Lee, MD, Boston, MA
Sarah Seo, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) identify laryngeal fractures based on clinical diagnosis; 2) understand the principles of open reduction and internal fixation (ORIF) of the larynx and trachea; 3) manage the airway in acute laryngeal and tracheal injury; and 4) develop an understanding of the management of crico-tracheal separation.

Objectives: External trauma to the larynx can threaten not only life but also the quality of life. Laryngeal fracture patients can present with a spectrum of clinical findings ranging from normal to airway collapse to death. We will therefore examine and emphasize clinical presentation, an algorithm for correct diagnosis and acute airway management, radiologic/physical exam findings, and demonstrate the appropriate surgical approach for optimum clinical outcome in cases of blunt and penetrating laryngeal injury. Herein we present one of the largest series of management of laryngeal and tracheal fractures in the literature from a tertiary care level 1 trauma center. **Study Design:** A retrospective chart review from 1998-2008. **Methods:** A retrospective chart analysis on patients presenting to the head and neck trauma service. **Results:** Our series consisted of 12 males and 1 female with a mean age of 39 years presenting with laryngeal fractures caused by blunt (n=11) or penetrating (n=2) trauma. One patient presented with complete laryngotracheal separation which was successfully managed by immediate tracheostomy and early surgical intervention. The other 12 patients had a combination of conservative (n= 6) and surgical (n=7) management. All patients who required a tracheotomy (n=7) were decannulated. **Conclusions:** Early suspicion and diagnosis of acute laryngeal and tracheal injuries are crucial. The airway must be secured via emergent tracheotomy when needed. CT scans play a central role in diagnosis. Proper restoration of the laryngeal framework with appropriately timed open reduction and internal fixation is critical for optimal recovery of the airway, voice, and swallowing.

E33. THIRD PRIZE - WILLIAM W. MONTGOMERY RESIDENT RESEARCH AWARD Incidence of Perioperative Airway Complications in Patients with Previous Medialization Thyroplasty

Harrison W. Lin, MD, Boston, MA

Neil Bhattacharyya, MD, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the incidence of perioperative airway complications in patients who have previously undergone vocal cord medialization with a nonabsorbable implant and describe perioperative management strategies to minimize the risk of these complications.

Objectives: Characterize perioperative airway complications in patients with medialization thyroplasty (MT) who subsequently undergo procedures requiring anesthesia. **Study Design:** Retrospective review of post-MT anesthesia encounters in a large academic hospital. **Methods:** A series of post-MT patients was reviewed, identifying anesthesia encounters with endotracheal intubation (ETI) or laryngeal mask airway (LMA). Details on the perioperative course of each encounter were extracted and examined for evidence of airway complications. The incidence of airway obstruction and need for airway intervention were determined. Relationships between complications and perioperative management were analyzed. **Results:** A total of 74 anesthesia encounters were identified among 219 post-MT patients. Perioperative airway complications arose in 5 procedures (6.8%, 95% confidence interval: 1.0-12.4%). Stridor in the operating or recovery room was exhibited three times, with all episodes requiring racemic epinephrine and intravenous steroids for resolution of symptoms. One patient underwent an urgent tracheostomy for severe stridor leading to airway compromise in the recovery room. Immediately after induction with an LMA, one patient failed to maintain oxygen saturations above 90% and consequently required conversion to ETI. **Conclusions:** The incidence of perioperative airway complications in post-MT patients is nonnegligible. Surgery, anesthesia and recovery room staff should be made aware of the increased risk of airway complications in patients who have previously undergone MT.

E34. Submucosal Neoplasms of the Laryngeal Introitus

Matthew J. Lutch, MD, Boston, MA
James A. Burns, MD, Boston, MA*
Aaron D. Friedman, MD, Boston, MA
Steven M. Zeitels, MD, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to better understand the spectrum of unique pathology that may present as a submucosal laryngeal mass.

Objectives: Submucosal neoplasms of the laryngeal introitus most frequently present as benign cystic masses, occult squamous carcinoma, or as an obvious postoperative sequelae such as a Teflon granuloma. However, rarely these tumors represent more uncommon pathologies, which can be challenging to diagnose and treat. The differential diagnosis of these lesions includes a spectrum of benign and malignant pathologies that are not frequently photodocumented. **Study Design:** Retrospective review of patients with submucosal neoplasms from 2002—2008. **Methods:** Medical records of 22 patients undergoing microlaryngoscopy for submucosal lesions of the laryngeal introitus (supraglottis: 10, glottis: 4, subglottis: 8) were reviewed. Patients' age, gender, clinical presentation, radiographic imaging, operative description, histologic diagnosis, and pre- & postoperative laryngeal imaging were recorded. More commonplace or obvious pathology were excluded; squamous cell carcinoma, mucosal cysts, amyloid, and Teflon granuloma. **Results:** 22 consecutive patients underwent endoscopic surgical diagnosis and/or treatment. The overwhelming majority were mesenchymal in origin. Pathology based on the epicenter of the lesion: supraglottis - hemangioma, sarcoid, lymphangioma, lipoma, granular cell tumor, synovial cell sarcoma, lymphoma, neuroendocrine carcinoma, and oncocytic tumor, glottis - rhabdomyoma and osteoma, subglottis - schwannoma, neurofibroma, adenoid cystic carcinoma, and chondrosarcoma. **Conclusions:** Not surprisingly, submucosal laryngeal neoplasms were most frequently mesenchymal in origin. The review herein and associated photodocumentation are useful when considering the differential diagnosis. The site of origin, degree of malignant behavior, and sensitivity to adjuvant cancer treatment determined the choice of surgical management; endolaryngeal versus transcervical and limited removal versus wider resection.

E35. Integration of Ultra High Speed Color Videoendoscopy with Time Synchronized Measures of Vocal Function

Daryush D. Mehta, SM, Boston, MA
Dimitar D. Deliyski, PhD, Columbia, SC
Steven M. Zeitels, MD, Boston, MA*
Matías Zañartu, MS, West Lafayette, IN
Robert E. Hillman, PhD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should have a fundamental understanding of the function, capabilities, and potential of this new high speed videoendoscopy based system to better elucidate and quantify laryngeal voice production mechanisms.

Objectives: To develop an innovative voice assessment system that can provide new insights into mechanisms of normal and

disordered voice production by integrating advances in ultra high speed color imaging with measures of vocal function. **Study Design:** Iterative development and testing of an integrated system that simultaneously acquires ultra high speed color endoscopic images of vocal fold vibration with time synchronized recordings of the acoustic, electroglottographic (EGG), and neck accelerometer signals. **Methods:** The system was built around a new high speed digital camera that has sufficient light sensitivity to record high resolution color images through a transoral endoscope at rates up to 10,000 frames per second. Specially designed devices for suspending and controlling the 7 lb. camera were fabricated to facilitate its uses for endoscopy. Approaches for time synchronization of simultaneously recorded signals were established, verified, and implemented using a high precision hardware/software solution. **Results:** Video and data synchronization was accomplished with very high accuracy to allow for direct (frame-by-frame) correlation between high resolution color images of vocal fold tissue motion captured at 10,000 frames per second and high bandwidth measures of vocal function from simultaneous acoustic, EGG, and accelerometer recordings. Example assessments of normal and disordered phonation clearly demonstrate the system's capabilities. **Conclusions:** This new system makes possible the application of more powerful digital image (e.g., digital kymography and mucosal wave kymography) and signal processing approaches to better elucidate and quantify vocal fold sound source mechanisms, particularly in cases where vocal fold vibration is irregular and/or asymmetric.

E36. Endoscopic Zenker's Diverticulotomy: Laboratory to Operating Room

Mariah L. Salloum, MD, Boston, MA
Jagdish K. Dhingra, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) learn different training tools for endoscopic Zenker's diverticulotomy; 2) learn limitations and indications of endoscopic approach; 3) compare endoscopic vs. open approaches; and 4) compare laser to stapling diverticulotomy.

Objectives: To report a single surgeon's experience in learning the endoscopic technique and to compare these outcomes to conventional techniques. **Study Design:** Laboratory experience and clinical retrospective chart review. **Methods:** Various training modalities including lectures, courses and hands-on training were utilized. Retrospective analysis of data from patients treated for Zenker's diverticulum in a community based practice over 6 years is reported. Methods of repair included open cricopharyngeal myotomy, endoscopic laser myotomy, and endoscopic stapling. Outcome measures, including operative time, length of hospital stay, complications, and time of recovery to oral feeding were compared. **Results:** The learning models utilized are described. Prior to incorporation of endoscopic technique, four patients were treated by conventional open techniques. Twenty endoscopic cases (four laser myotomies and 16 stapling procedures) were performed over a 5 year period. The average operative time of the endoscopic stapling technique was less than with laser myotomy, and these patients had a decreased length of hospital stay and shorter time to oral feeding. Complications of endoscopic techniques included one iatrogenic tear of the diverticulum during initial exposure, resulting in a conversion from endoscopic to open repair. One patient required revision surgery. **Conclusions:** Zenker's diverticulum is a relatively uncommon, but often disabling condition in the elderly population. Endoscopic repairs are ideal as they shorten surgical time and postoperative recovery. As the condition is relatively uncommon and experience during training programs limited, there is a need for hands-on learning in the laboratory. Endoscopic stapling repair of Zenker's diverticulum is an easily learnt, safe and desirable technique.

Otology/Plastics-Aesthetics/General

E37. Oromandibular Dystonia in Cerebrotendinous Xanthomatosis

Brian E. Benson, MD, New York, NY
Andrew Blitzer, MD DDS, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate awareness of oromandibular dystonias resulting from lipid storage disorders and appreciate the role for chemo-denervation in this setting.

Objectives: Describe the evaluation and treatment of oromandibular dystonias in a rare lipid storage disease. **Study Design:** Case report. **Methods:** Chart review. **Results:** Cerebrotendinous xanthomatosis (CTX) is a rare, inherited lipid storage disease caused by mutations in the sterol 27-hydroxylase gene. This defect in bile acid synthesis results in the accumulation of cholestanol and cholesterol in all tissues, especially the tendons, brain, and lungs. CTX is characterized clinically by premature bilateral cataracts, premature atherosclerosis, and progressive neurological dysfunction. The neurologic sequelae of this disease include cerebellar ataxia, systemic spinal cord involvement, peripheral neuropathy, seizures, and a pseudobulbar phase leading to death. The diagnosis is made by demonstrating elevated serum cholestanol. Treatment with chenodeoxycholic acid (CDCA) and statin medications may arrest the progression of the disease. A 38 year old female with CTX, diagnosed in 2002, developed abnormal jaw movements which prevented normal speaking, mastication, and swallowing. She was PEG dependent, although she could tolerate small amounts of a modified diet. Physical examination revealed severe dysarthria due to an

open jaw posture with frequent tongue curling. Palate elevation was symmetric and the gag reflex was intact. Fiberoptic evaluation revealed no velopharyngeal insufficiency and full vocal fold motion with normal phonation, despite occasional dyscoordination. Complete glottic closure was achieved during swallowing. She was treated with botulinum toxin injections to the external pterygoid muscles and the anterior belly of the digastric muscle, with improvement of her symptoms. **Conclusions:** We describe a novel secondary oromandibular dystonia due to CTX which responded to treatment with botulinum toxin chemo-denervation.

E38. Metastatic Pancreatic Carcinoma Presenting with Facial Nerve Paralysis

Nitin Bhatia, MD, Boston, MA
Mazin Merdad, MD, Boston, MA
Carl B. Heilman, MD, Boston, MA
Weiru Shao, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the etiology, presentation and management of unusual cerebellopontine angle (CPA) masses.

Objectives: To present a case of pancreatic cancer metastasis to the internal auditory canal (IAC) initially diagnosed as a Bell's palsy. A literature review and discussion regarding evaluation of metastatic IAC and cerebellopontine angle (CPA) lesions is presented. **Study Design:** Case report and literature review. **Methods:** 1) Review of patient medical records; and 2) Medline search for medical literature pertinent to metastatic CPA masses. **Results:** This patient presented with sudden unilateral facial paralysis initially diagnosed as a Bell's palsy. Magnetic resonance imaging (MRI) revealed bilateral IAC enhancement. In the following months, the patient developed hearing loss, vertigo, tinnitus, and expressive aphasia. Followup scans revealed rapid enlargement of the left IAC lesion extending to CPA. A biopsy of the lesion revealed metastatic adenocarcinoma and further investigation confirmed pancreatic origin. The patient was offered palliative treatment. **Conclusions:** Metastatic IAC and CPA masses are uncommon. Bell's palsy without clinical improvement is uncommon and requires further investigation. This case highlights the importance of considering metastatic pathology in patients with IAC lesions and rapidly worsening symptoms.

E39. Head and Neck Sequelae of Torture

Christina Di Loreto, BFA, Boston, MA
Shaulnie N. Mohan, BS, Boston, MA (Presenter)
Sondra S. Crosby, MD, Boston, MA
Jeffrey H. Spiegel, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize and treat manifestations of torture of the head and neck.

Objectives: Amnesty International reported that torture occurred in 102 countries in 2007, and many torture survivors seek refuge in the USA. Physicians are often not trained to recognize torture, and survivors are often reluctant to discuss their experiences. Our aim is to review common methods and manifestations of head and neck torture in order to provide otolaryngologists and referring physicians with an improved framework for recognizing and treating torture to the head and neck. **Study Design:** Retrospective chart review of patients who have experienced head and neck torture among a cohort of refugee, asylees, and asylum seekers referred between January 2002 and January 2008. **Methods:** A case series of torture survivors (using the UN definition of torture) will be presented in detail and will include demographics, torture history including the political context, medical and psychiatric history, physical exam, radiological studies, diagnosis, and treatment. **Results:** Patients who presented with a history significant for head and neck torture will be reviewed. Cases of head and neck torture will include facial trauma, severed ear, vestibular damage, tympanic membrane, and vocal cord damage. **Conclusions:** Recognition and treatment of the manifestations of head and neck torture are important when treating asylum seeking and refugee populations, including appropriate referrals to specialized centers for survivors of torture.

E40. Progressive Mixed Type Hearing Loss in an Adult Male with Osteopetrosis

John P. Gniady, MD, Philadelphia, PA
Max L. Ronis, MD, Philadelphia, PA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the otologic manifestations of adult type osteopetrosis.

Objectives: To educate the reader about the otologic aspects of adult type osteopetrosis. **Study Design:** Case report and review of the literature. **Methods:** We present a case report of a man in the fifth decade of life with known diagnosis of osteopet-

rosis who presented to our otology clinic with a progressive, mixed sensorineural/conductive hearing loss. Radiographic images demonstrate near total sclerotic lesions of the temporal bone as well as the cranial sinuses. A review of the otolaryngology literature was also conducted to assess the general level of awareness of our community to the manifestations of osteopetrosis. **Results:** Several large case series relating to manifestations of infantile of juvenile type osteopetrosis were identified, but a relative paucity of references to manifestations in the adult population exist. **Conclusions:** Osteopetrosis is a complex of several inherited diseases characterized by sclerotic bone lesions secondary to the failure of osteoclast mediated bone resorption. While most practitioners may never come across a patient with this rare disorder, particularly of the adult type, it is nonetheless important for us to keep informed of the manifestations and presentation of this unusual cause of mixed type hearing loss.

E41. Mastoid Osteoma: A Case Report

Gregg H. Goldstein, MD, New York, NY
Benjamin D. Malkin, MD, New York, NY
Sujana S. Chandrasekhar, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the manifestations, diagnosis, and treatment of mastoid osteomas.

Objectives: To describe a rare case of mastoid osteoma and discuss its association with Gardner's syndrome, including associated diagnostic and treatment strategies. **Study Design:** Case report. **Methods:** The patient chart, including pertinent history, physical examination, clinical course and ancillary studies were reviewed. A literature search was performed and appropriate papers were identified. **Results:** A 50 year old woman presented with a progressively enlarging, firm mass over the right mastoid process and a small mass at the inferior border of the right mandible for a duration of twenty years. Coronal and axial CT scans revealed a large, smooth, bony mass arising from the mastoid cortex; additionally seen was a small bony protuberance off the outer cortex of the mandible. Both of these lesions were radiographically compatible with a diagnosis of osteoma. The patient underwent upper gastrointestinal and small bowel series, which were normal, to rule out Gardner's syndrome. The mastoid lesion was surgically excised for definitive diagnosis as well as cosmesis, and pathologic examination confirmed it to be an osteoma. The differential diagnosis of isolated, multiple and syndromic temporal bone lesions is discussed, as well as common methods of surgical excision. **Conclusions:** Mastoid osteoma is a rare benign bone neoplasm that can cause significant cosmetic deformity. CT should reveal a well demarcated lesion and surgical resection allows definitive pathologic diagnosis and treatment with low risk of complications. Multiple osteomas of the skull should lead to further studies to rule out Gardner's syndrome.

E42. Recording Videoendoscopy Using a Portable Media Device: A Novel Solution in the Age of Digital Media

Tucker M. Harris, MD, Syracuse, NY
Parul Goyal, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to 1) describe different methods available for recording and archiving videoendoscopy; 2) understand how a portable media device can be adapted to create an affordable endoscopy recording solution; and 3) describe the benefits of digital recording of endoscopy over analog recording.

Objectives: Flexible and rigid endoscopies are routine components in the evaluation of many otolaryngology patients. Recording and archiving the endoscopic findings can enhance patient care, improve education of patients, trainees, and colleagues, and contribute to medical research. Equipment used to record endoscopies has typically been very expensive, with costs in the tens of thousands of dollars. The goal of this report is to describe the use of a portable and inexpensive device for recording and archiving endoscopies performed by otolaryngologists in a variety of settings. **Study Design:** Report of a technique and literature review. **Methods:** A portable multimedia recording device has been adapted for endoscopy recording. The media device is connected to the video output line of an endoscope camera. The device is handheld, allowing it to be transported easily. **Results:** The system described has been used for the purposes of recording, archiving, and reviewing endoscopies. The system has been used in the office, ward, and emergency department settings by many members of the otolaryngology department with ease. **Conclusions:** Technological advances have improved the ability to record and archive endoscopic findings for patient care, educational, and research purposes. Commercially available portable media devices provide a portable and affordable solution for use in a variety of clinical settings. Use of such devices can allow for rapid documentation of endoscopic findings, allowing for improved patient care and communication among physicians. These devices allow physicians to record endoscopy while avoiding the high costs associated with "medical grade" endoscopy recording units.

E43. Laser Disruption and Killing of MRSA Biofilms

Yosef P. Krespi, MD, New York, NY*
Victor Kizhner, MD, New York, NY

Paul Stoodley, PhD, Pittsburgh, PA
Luanne Hall-Stoodley, PhD, Pittsburgh, PA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the effects of two different lasers in controlling MRSA biofilms.

Objectives: To study the efficacy of two different lasers in vitro, in disrupting biofilm and killing planktonic pathogenic bacteria. **Study Design:** Biofilms of *S. aureus* Xen 31, a stable bioluminescent clinical MRSA construct, were grown in a 96 well microtiter plate for three days. The study included seven arms; a) control; b) ciprofloxacin (3 mg/L, the established MIC) alone; c) SW laser alone; d) NIR laser alone; e) SW laser and ciprofloxacin; f) SW and NIR lasers; g) SW, NIR lasers and ciprofloxacin. **Methods:** The study results were evaluated with an IVIS biophotonic system (for live bacteria) and optical density (for total bacteria). **Results:** With no antibiotics there was a 43% reduction in OD ($P < 0.05$) caused by the combination of SW and NIR suggesting that biofilm had been disrupted. There was an 88% reduction ($P < 0.05$) in live biofilm. Ciprofloxacin alone resulted in a decrease of 28% of total live cells (biofilm remaining attached and disrupted planktonic cells) and 58% of biofilm cells (both $P > 0.05$). Ciprofloxacin in combination with SW and SW + NIR lasers caused a decrease of over 60% in total live biomass and over 80% of biofilm cells, which was significantly greater than ciprofloxacin alone ($P < 0.05$). **Conclusions:** We have demonstrated an effective nonpharmacologic treatment method for MRSA biofilm disruption and killing using two different lasers. The preferred treatment sequence is a shockwave laser followed by NIR laser. Treatment optimization of biofilm is possible with the addition of ciprofloxacin in concentrations consistent with planktonic MIC.

E44. Gender Variations in Frontal Sinus Anatomy, as Determined by Computed Tomography: Implications for Cranioplasty and Sinus Surgery

Matthew K. Lee, BA, Boston, MA
Osamu Sakai, MD, Boston, MA
Jeffrey H. Spiegel, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to understand gender variation in frontal sinus anatomy in coronal, axial, and sagittal dimensions and discuss implications for cranioplasty.

Objectives: To determine gender variations in frontal sinus anatomy that may have significance for cranioplasty and sinus surgery. **Study Design:** Computer assisted anatomic measurement utilizing existing head CT images performed at a university hospital between 1/1/2008—6/11/2008. **Methods:** 100 males and 50 females were selected. Frontal sinus dimensions and forehead measurements were made at midline and at 10, 20, and 30mm to the left and right of midline using sagittal, coronal, and axial images. Data was analyzed for significant differences ($\pm = 0.05$) between measurements made at midline and to the left and right of midline, as well as for differences between gender groups. **Results:** Mean anterior table thickness ranged from 2.6 to 4.1 mm and was found to be thinnest at 10mm left and right of midline (2.9 and 2.6 mm). Mean anteroposterior depth of the frontal sinus at the level of the supraorbital ridge ranged from 8.0 to 9.3 mm and was not found to vary significantly at any distance from midline. Frontal sinus height was found to be greatest at midline (mean = 24.5mm) and progressively lessened with increasing distance from midline. Mean total width at the level of the supraorbital ridge was 52.2 mm. For all measurements, no significant left to right variation was noted as a group. Comparing between genders, males were found to have greater dimensions in nearly all frontal sinus measurements, though most of these differences were only found to be significant at or close to midline. The male forehead was marked by more acute nasofrontal angle (119.9° versus 133.5°), steeper posterior forehead inclination (-7.2° versus -3.5°), and a wider glabella (44.4 versus 33.9 mm). Males were found to have more frequent protrusion of the frontal sinus beyond this goal slope line compared to females (51% vs. 30%). **Conclusions:** There are significant gender variations between men and women in frontal sinus and forehead anatomy. Clinical implications of these findings relevant to sinus surgery and forehead cranioplasty will be reviewed.

E45. Myosin VIIa Monoclonal Antibody Labels Normal and Dying Hair Cells in the Gentamicin Treated Avian Cochlea

Matthew K. Lee, BA, Boston, MA
Christina L. Kaiser, PhD, Boston, MA
Brittany J. Chapman, BA, Boston, MA
Douglas A. Cotanche, PhD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain that labeling hair cells is possible with both monoclonal and polyclonal antibodies raised against the structural protein myosin VIIa. In addition, they should be able to discuss the changes that occur in myosin VIIa labeling as hair cells undergo gentamicin induced programmed cell death.

Objectives: Myosin VIIa is a motor protein critical to the survival of cochlear hair cells. Mutations in the myosin VIIa gene cause

hair cell death and deafness. We will determine if a monoclonal antibody to myosin VIIa labels normal and dying hair cells similarly to a well characterized polyclonal myosin VIIa antibody used routinely for identifying hair cells. **Study Design:** Two week old chicks get a single gentamicin injection to induce hair cell loss in the basal 30% of the cochlea. Birds survived for 1-4 days after the gentamicin when their cochleae were extracted and processed for immunocytochemical analysis. **Methods:** Cochleae were labeled with either a monoclonal or polyclonal primary antibody to myosin VIIa followed by an appropriate secondary antibody. The cochleae were counter-stained with phalloidin, a fluorescently tagged probe for actin filaments. The whole mount cochleae were examined with a Zeiss 510 Meta confocal microscope. **Results:** The monoclonal myosin VIIa antibody labeled normal hair cells in a manner identical to the polyclonal antibody. It also labeled myosin reorganization in dying hair cells being ejected from the cochlea and afterwards when they were dead but trapped in the overlying tectorial membrane. **Conclusions:** Both the polyclonal and monoclonal antibodies we tested equivalently and specifically label normal and dying hair cells in the chick cochlea. This enables much more flexibility in co-labeling hair cells with the monoclonal myosin VIIa antibody and other polyclonal antibodies to a wide variety of hair cell structural, developmental and damage induced proteins.

E46. External Auditory Canal Cholesteatoma and Keratosis Obturans: the Role of Imaging in Preventing Facial Nerve Injury

Edward D. McCoul, MD MPH, Brooklyn, NY

Matthew B. Hanson, MD, Brooklyn, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the similarities and differences between external auditory canal cholesteatoma and keratosis obturans, and to discuss the role of imaging studies in preventing iatrogenic complications.

Objectives: We sought to report a series of external auditory canal cholesteatoma (EACC), to contrast with the similar entity of keratosis obturans (KO), and to identify aspects of disease presentation that may lead to complications. **Study Design:** Case series. **Methods:** Five cases of EACC diagnosed between 2005 and 2008 were identified from clinical records. Six cases of KO diagnosed during the same period were included for comparison. Imaging studies were reviewed for evidence of bony erosion and proximity of disease to vital structures. **Results:** All 5 patients with EACC had diagnosis confirmed by computed tomography (CT) imaging that demonstrated widening of the bony external auditory canal. Three of these patients had critical erosion of bone adjacent to the facial nerve. In contrast, two patients with KO underwent CT imaging, neither of which demonstrated bony erosion or expansion. One patient manifested KO as part of a dermatophytid reaction, and one developed osteomyelitis of the temporal bone. The essential component of treatment in all cases was microscopic debridement of the ear canal. Case descriptions are presented, as well as a summary of symptoms and objective findings. **Conclusions:** EACC may produce significant erosion of bone with exposure of vital structures, including the facial nerve. Because of the clinical similarity to KO, misdiagnosis is possible. Temporal bone imaging should be obtained prior to attempts at debridement of suspected canal keratosis. Increased awareness of these uncommon conditions is warranted to prompt appropriate investigation and prevent iatrogenic complications such as facial nerve injury.

E47. Establishing a Training Program for Residents in Robotic Surgery

Jeremiah J. Moles, MD, Newark, NJ

Evan E. Sarti, BS, Newark, NJ

Soly Baredes, MD, Newark, NJ*

Educational Objective: At the conclusion of this presentation, the participants should be able to define different types of robot/surgeon interactions; understand the techniques of basic robotic surgical skills; and understand how to establish a resident training program in robotic surgery.

Objectives: To develop a program for teaching robotic skills to residents. To assess the development and retention of proficiency in basic robotic surgical skills in a resident cohort. **Study Design:** Prospective educational project using a commercially available surgical robot. Residents use a surgical robot to complete a designated set of tasks intended to simulate real surgical maneuvers. Performance is analyzed for errors and total time of procedure. **Methods:** Otolaryngology residents are introduced to robotic surgery with a tutorial on the usage of the da Vinci Surgical Robot. Participants perform defined exercises accomplishing the following tasks: circular pin transfer, simultaneous bimanual carrying, precision bead drop, simple needle passing, precision needle passing, and suture tying. Performance of these tasks can be quantitatively assessed/tracked over time. **Results:** An educational program for teaching residents basic robotic skills can easily be introduced into a residency program. Resident progress in acquiring robotic surgical skills can be measured and tracked. The results of our pilot study on resident acquisition of robotic skills will be presented. **Conclusions:** Robotic surgery will likely become an integral part of otolaryngologic surgical practice. Training programs in robotic surgery need to be formally established in residency programs. We present an educational program for introducing robotic surgical skills in residency training.

E48. Parotidectomy in a Community Setting: Apropos of 100 Consecutive Cases

Aric K. Park, MD, Boston, MA
Jagdish Dhingra, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss prognostic factors in parotid tumor resection based on clinical presentation. Distribution of pathology of parotid tumors, and role of preoperative workup including imaging and FNA would be discussed in detail. Surgical techniques found useful in reducing postoperative morbidity will be discussed.

Objectives: This study aims to evaluate prognostic factors, complications, surgical technique, review pathology, and discuss the role of workup including imaging and FNA in a series of parotidectomies performed by a single surgeon in a community setting. **Study Design:** Retrospective case series. Clinicopathological data from the first 100 consecutive parotidectomies performed by a single surgeon (senior author), between 2003 and 2008, in a community setting was collected into a parotidectomy database for analysis. **Methods:** Parotidectomy database was analyzed retrospectively. **Results:** Clinical data including presenting symptoms, rate of growth, and tumor location provides useful indicators to pathology and prognosis. Pathology distribution is similar to that reported from earlier studies from tertiary care centers. Perioperative frozen section was found to be more useful determinant of surgical extent than preoperative workup by imaging study and FNA. Subtotal lateral parotidectomy was found suitable in as many as 30% of the cases, reducing the operative time and postoperative morbidity. A relatively low incidence of complications such as Frey's syndrome (2%) and seroma (5%) was found. **Conclusions:** Parotidectomy can be safely performed in a community setting without compromising on patient care. Where indicated limited lateral parotidectomy is a safe option with reduced complication rate and improved cosmesis.

E49. Case Report of Patient with Vogt-Koyanagi-Harada Syndrome Treated with Intratympanic Steroids

Stanley Pelosi, MD, New York, NY
Sujana Chandrasekhar, MD*, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to describe Vogt-Koyanagi-Harada (VHK) syndrome as a cause of inner ear symptoms and recognize the possible utility of intratympanic steroid injections for its treatment.

Objectives: To describe the case of a patient with VHK syndrome treated successfully with intratympanic steroid injections. To discuss the otologic manifestations of VHK syndrome and treatment options reported in the literature. **Study Design:** Case report. **Methods:** The patient's chart was reviewed, and the pertinent history, clinical course, and audiologic studies are discussed. A review of the recent literature was performed. **Results:** The patient is a 68 year old woman previously diagnosed with VHK syndrome, presenting to the otologist with longstanding fluctuating vertigo, tinnitus, and bilateral sensorineural hearing loss. She experienced dramatic improvement in her symptoms after intratympanic steroid injections. This is the first published report of a patient with VHK syndrome treated successfully with intratympanic steroids. **Conclusions:** In patients with VHK syndrome who experience otologic manifestations, intratympanic steroids are an option for those who do not tolerate systemic therapy.

E50. Treatment of "Asymptomatic" Zenker's Diverticulum: The Importance of Open Techniques in a Complex Presentation

Joel E. Portnoy, MD, Syracuse, NY
Tucker M. Harris, MD, Syracuse, NY
Sydney C. Butts, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to demonstrate understanding of the modern management of Zenker's diverticula, compare the different imaging modalities used in their detection, and discuss when open techniques may be essential for proper management.

Objectives: To present a case describing the incidental finding of a Zenker's diverticulum during exploration for a parathyroid adenoma and discuss decision making in diagnosis and management in complex presentations. **Study Design:** Case report. **Methods:** A single case was reported and relevant literature was reviewed. **Results:** N/A. **Conclusions:** 1) Endoscopic management of Zenker's diverticulum, though less invasive and less morbid, does not completely replace conventional techniques, especially in complex situations such as diverticulum perforation; and 2) preoperative imaging such as ultrasound and/or CT/MRI is useful in differentiating pathology and defining relevant anatomy preoperatively before surgically exploring the neck.

E51. Cochlear Implantation following Treatment for Medulloblastoma

John Thomas Roland Jr., MD, New York, NY*
Tracey N. Liebman, BA, New York, NY
Susan B. Waltzman, PhD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the surgical, chemotherapy and radiation treatment for medulloblastoma, the effects of this treatment and discuss the benefits of cochlear implantation for resulting SNHL following treatment for medulloblastoma.

Objectives: Medulloblastoma, a primitive neuroectodermal tumor that grows in the cerebellum, is the most prevalent CNS tumor in children comprising 20% of all childhood intracranial tumors. Currently, the standard course of treatment includes surgery, chemotherapy and radiation with progressive postradiation and ototoxic related sensorineural hearing loss (SNHL) being a side effect of treatment. The purpose of this study was to evaluate the effect of cochlear implantation on patients with SNHL following treatment for medulloblastoma. **Study Design:** Retrospective chart review. **Methods:** Three children treated for medulloblastoma between 4-14 years of age who later exhibited SNHL underwent cochlear implantation at ages 13-29 years. Length of device usage ranged from 6 months—2 years. The progression of SNHL, otologic condition at time of implant candidacy and complications were studied and open set monosyllabic word and sentence tests in quiet and noise were administered preoperatively and at regular intervals postoperatively. Factors included in the analyses were age of diagnosis of medulloblastoma, surgical management, radiation dose and chemotherapy drug, dose and duration. **Results:** All three patients had full insertions of the cochlear implant electrode array with no complications and showed significant improvement in word and sentence scores in quiet and noise following implantation despite radiation dosage or chemotherapy agent. **Conclusions:** Cochlear implantation is an effective treatment for hearing loss in patients treated for medulloblastoma.

E52. Malignant Meningioma of the Temporal Bone

Ian M. Sambur, MD, New York, NY
Fred Y Lin, MD, New York, NY
Joshua B. Bederson, MD, New York, NY
Eric E. Smouha, MD, New York, NY*

Educational Objective: At the conclusion of this presentation, the participants should be able to understand the differential diagnosis of jugular foramen lesions, and to review the incidence, biological behavior, and treatment of malignant meningioma.

Objectives: To highlight the importance of considering malignant meningioma in the differential diagnosis of jugular foramen lesions, and to review the incidence, biological behavior, and treatment of this disease. **Study Design:** Case report and literature review of malignant meningioma. **Methods:** A patient is presented who complained of hearing loss for 4 months and a growth in the external auditory canal. He was evaluated with MRI, CT, angiography, and a tissue biopsy, with the final pathology revealing malignant meningioma. He was treated with total resection of the tumor in a two stage combined skull base approach with a neurosurgeon, plus postoperative radiation therapy. **Results:** The patient has remained disease free for 2 years post-treatment with excellent quality of life. **Conclusions:** Malignant meningiomas are relatively rare and behave aggressively. When they occur in the jugulare foramen they may mimic glomus jugulare and schwannoma. Aggressive and timely surgical excision may yield a good outcome despite their poor prognosis.

Pediatrics/Sinus-Rhinology

E53. Minimally Invasive Endoscopic Approach to the Paranasal Sinuses and Skull Base in the Pediatric Population Using Image Guidance Systems

Margo McKenna Benoit, MD, Boston, MA
V. Michelle Silvera, MD, Boston, MA
Dwight T. Jones, MD, Boston, MA
Trevor J. McGill, MD, Boston, MA
Reza Rahbar, DMD MD, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the indications for image guidance systems in the pediatric sinonasal and skull base endoscopic surgery, and the relevant patient and surgeon variables.

Objectives: To evaluate the use of image guidance surgery systems to facilitate an endoscopic minimally invasive approach to sinonasal and skull base surgery in a pediatric population. **Study Design:** Retrospective cohort study at a tertiary pediatric

hospital. **Methods:** Twenty-five children underwent sinonasal or skull base surgery from February 2000 through May 2007 using an image guidance system. Patient variables including diagnosis, extent of disease, clinical outcome and complications were extracted from paper and computer charts. Additional surgeon variables including satisfaction index, number of uses per case, and degree of comfort using image guidance systems were also reviewed. **Results:** Eighteen patients (72%) underwent sinonasal surgery and seven (28%) underwent skull base surgery. Indications included infectious complications of sinusitis (N=9), neoplasms (N=9), choanal atresia (N=5), and cerebrospinal fluid leak (N=2). No surgical complications were reported. Twenty-two patients (88%) required only one procedure. Over the course of the study, image guidance systems were used for increasingly difficult cases and the number of uses per procedure increased. Surgeon satisfaction and degree of comfort increased over time. **Conclusions:** Image guidance systems are safe and effective tools that facilitate a minimally invasive approach to sinonasal and skull base surgery in children. Consistent with adult literature, initial use of image guidance during the learning period tends to involve routine procedures while over time image guidance is used for difficult or revision cases. The additional anatomical information obtained by image guidance systems helps in the minimally invasive endoscopic approach for sinonasal and skull base pathologies.

E54. Familial Congenital Bilateral Vocal Fold Paralysis - A Novel Gene Translocation

Amy K. Hsu, MD, New York, NY
Scott M. Rickert, MD, New York, NY
Robert J. Wallerstein, MD, Hackensack, NJ
Max M. April, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss genetic factors in familial congenital bilateral vocal fold paralysis.

Objectives: To identify genetic factors in familial congenital vocal fold dysfunction. **Study Design:** Case series of three family members with congenital vocal fold dysfunction. **Methods:** We describe a family where three members were affected by congenital bilateral vocal fold dysfunction. The mother and her two daughters presented with respiratory distress at birth. The mother and first daughter both underwent tracheotomy in the first two weeks of life for airway distress secondary to bilateral vocal fold paralysis. Currently the younger daughter is being followed closely, but tracheotomy has not been performed. The patients had no other associated anomalies. Blood samples were taken from the mother, the two daughters, and the maternal grandparents for genetic analysis. **Results:** The mother and two daughters share the same balanced translocation between chromosomes 5 and 14, t(5:14) (p15.3, q11.2). Neither the maternal grandmother nor grandfather has the translocation. The translocation appears to be a spontaneous mutation in the mother with an autosomal dominant mode of inheritance and variable penetrance. **Conclusions:** We identified a chromosomal translocation shared by three family members with congenital vocal fold dysfunction and no other associated abnormalities. To our knowledge, this represents the first description of a chromosome 5 and 14 translocation associated with congenital bilateral vocal fold paralysis.

E55. Cystic Pilomatrixoma: A Diagnostic Challenge

Kiran Kakarala, MD, Boston, MA
Matthew T. Brigger, MD, Boston, MA
William C. Faquin, MD PhD, Boston, MA
Christopher J. Hartnick, MD, Boston, MA*
Michael J. Cunningham, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to recognize the clinical, radiologic, and pathologic features of pilomatrixoma and be able to recognize the cystic variant presentation of this lesion.

Objectives: 1) Present two childhood cases of preauricular cystic pilomatrixoma; and 2) review the literature on the diagnosis and management of pilomatrixoma. **Study Design:** Case report series. **Methods:** Retrospective review of two childhood cases of cystic pilomatrixoma including a comprehensive review of the relevant literature. **Results:** Two children, ages 11 and 7, with cystic preauricular masses are presented. FNA of cyst contents was nondiagnostic and cyst cultures were negative. Computed tomography scans revealed cystic masses superficial to the parotid gland but no distinctive radiologic features characteristic of pilomatrixoma. Complete lesion excision via a preauricular facelift approach was performed in both cases. The histopathologic features included basaloid cells surrounding a cystic space containing keratin debris and characteristic ghost cells consistent with the diagnosis of pilomatrixoma. There has been no evidence of recurrence at 1 and 6 years followup, respectively. **Conclusions:** Pilomatrixoma is a benign neoplasm which manifests frequently in the head and neck in children, typically with quite classic physical examination and radiologic features. However, clinical misdiagnosis may occur in the setting of a preauricular cystic mass presentation. Such cases may be challenging to diagnose even with preoperative imaging and cytology. The treatment of pilomatrixoma is surgical with complete excision yielding a low recurrence rate.

E56. Reformation of Conchae Bullosae following Treatment with Crushing Technique: Implications for Balloon Sinuplasty

David A. Kieff, MD, Boston, MA

Nicolas Y. Busaba, MD, Boston, MA*

Educational Objective: At the conclusion of this presentation, the participants should be able to comment on and discuss the reformation of conchae bullosae air cells and the implication this may have for sinuplasty surgery techniques.

Objectives: There are various surgical techniques designed to treat conchae bullosae (CB). These include partial or total resection, as well as crushing. Frontal sinus balloon sinuplasty is thought to work by the crushing/remodeling of the agger nasi and frontal recess air cells. The long term of sinuplasty in the frontal/ethmoid air cell region is unknown. To date, no study has been done on the reformation of CB after crushing. **Study Design:** Retrospective case series. **Methods:** Retrospective case series of 10 patients who represented with CB as a component of their nasal obstructive symptoms despite previously undergoing crushing of their CB. Data analyzed included paranasal sinus CTs and operative reports. **Results:** These 10 patients represented with recurrent rhinosinusitis and nasal obstructive symptoms. The patients had previously undergone septoplasty surgery with crushing of the CB and were noted to have reformed the CB on their most recent sinus CT. The previous surgeries were preformed from 2-15 years prior to their representation. **Conclusions:** CB can reform following crushing technique. One may extrapolate that agger nasi and frontal recess air cells may reform following balloon sinuplasty leading to recurrent obstruction of the frontal sinus outflow tract.

E57. Extraorbital Pseudotumor of the Petrous Apex

Jeffrey J. Nelson, MD, Syracuse, NY

Parul Goyal, MD, Syracuse, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to consider an extraorbital pseudotumor in the differential diagnosis of a skull base lesion and be aware of open and endoscopic options for biopsy.

Objectives: Although the literature is replete with pseudotumors of the orbit, extraorbital idiopathic pseudotumors of the skull base are very uncommon. Clinician awareness of skull base manifestations is essential in order to properly diagnose and manage such inflammatory disorders. **Study Design:** Case report and review of the literature. **Methods:** We report a case of an extraorbital pseudotumor of the petrous apex and cavernous sinus. In addition, we include a literature review of pseudotumors of the skull base. **Results:** A patient presented with left ophthalmoplegia and vision loss. Imaging studies revealed an enhancing lesion involving the left petrous apex and cavernous sinus. A transnasal endoscopic approach was used to perform a biopsy of the left petrous apex. Pathology revealed idiopathic pseudotumor. The patient has been treated with high dose steroids with significant improvement. **Conclusions:** Fewer than 25 cases of extraorbital skull base pseudotumor have been reported. No previous reports have documented involvement of the petrous apex. Diagnosis and treatment of this condition are challenging. Diagnosis is based on clinical and histological findings, and endoscopic techniques may allow access to many regions of the skull base with lower morbidity than traditional open procedures. Treatment involves high dose steroids, with steroid sparing regimens or even radiotherapy reserved for patients with refractory disease or intolerance to steroids. Extraorbital pseudotumors are a rare entity which must remain on a differential diagnosis of lesions of the skull base.

E58. Disseminated Fusariosis Presenting with Mucosal Ulcers

Alicia M. Quesnel, MD, Boston, MA

Julia Turbiner, MD, Boston, MA

Daniel G. Deschler, MD, Boston, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to explain the need to have a high suspicion for disseminated fungal infection in the immunocompromised host with mucosal ulcers. Participants should be aware of an emerging pathogenic mold named *Fusarium*, which may cause invasive sinonasal infection, laryngeal infection, or disseminated infection.

Objectives: 1) Describe an unusual presentation of a rare, but highly lethal fungal infection relevant to the otolaryngologist; 2) raise awareness of *Fusarium*, an emerging pathogenic mold, with potential for serious infection in the immunocompromised patient; and 3) emphasize the need for prompt diagnosis and treatment in disseminated fusarial infection. **Study Design:** Case report. **Methods:** A case report of a new presentation of disseminated fusariosis and a brief discussion of its relevance to the otolaryngologist. **Results:** Invasive fungal infections are associated with high mortality in immunocompromised patients, and *Fusarium* species are emerging as an important pathogenic mold in this population. Disseminated fusariosis most commonly presents as a persistent fever and characteristic rapidly evolving skin lesions in an immunocompromised host with prolonged, severe neutropenia. Although a sinonasal biopsy or bronchoalveolar lavage may confirm local invasive disease, a positive blood

culture or skin lesion biopsy usually leads to the diagnosis of disseminated disease. We report a case of disseminated fusariosis in an afebrile, immunocompromised patient. He initially presented with painful laryngeal ulcers and required nasal septectomy for invasive rhinitis. To our knowledge, this is the first reported case of presentation with odynophagia and diagnosis of disseminated infection by laryngeal and nasal ulcer biopsies. **Conclusions:** Invasive and disseminated fungal infections are almost universally seen in immunocompromised hosts, and otolaryngologists may assist with diagnosis of these infections when symptoms localize to the head and neck. Despite its rarity, invasive fusarial infection should be on the differential diagnosis for any immunocompromised patient with mucosal ulcers.

E59. Three Dimensional Endoscopic Approach to the Pterygopalatine and Infratemporal Fossa: An Anatomic Study

Ameet S. Singh, MD, New York, NY
Jonathan H. Roth, MD, New York, NY
Vijay K. Anand, MD, New York, NY*
Gurston G. Nyquist, MD, New York, NY
Theodore H. Schwartz, MD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to compare the three dimensional versus the two dimensional endoscopic approach to the pterygopalatine and infratemporal fossa.

Objectives: Endoscopic approaches to the pterygopalatine and infratemporal fossa are being utilized for a variety of infectious, vascular, benign and malignant pathology. Significant advances in endoscope optics, instrumentation, image guidance, and surgical anatomy have achieved successful outcomes in this complex anatomic region. However, the lack of three dimensional visualization remains a disadvantage for the endoscopic technique. A novel three dimensional endoscope may improve depth perception and visualization for management of pterygopalatine and infratemporal fossa lesions, among other skull base lesions. **Study Design:** Cadaveric comparative study. **Methods:** Three cadaveric heads were lightly fixed and injected. A three dimensional endoscope (Visionsense Ltd, Israel) based on insect eye technology was used to perform bilateral transpterygoid approaches to the pterygopalatine and infratemporal fossae. Pictorial and video documentation of the approach and key anatomical areas was recorded with the three and two dimensional endoscopes. In addition, depth perception, surgeon comfort, and surgical visualization was noted for both technologies. **Results:** Improved depth perception and spatial resolution was noted with the three dimensional endoscope. The complex anatomy of the pterygopalatine and infratemporal fossa was significantly enhanced. The three dimensional perception of the surgical field was achieved immediately without the surgeon suffering any side effects. However, the clarity and pixilated resolution remained superior with the two dimensional endoscope. **Conclusions:** The increased spatial orientation and depth perception of the three dimensional endoscope may represent a significant advance for endoscopic transpterygoid and other skull base approaches. This advance may enhance the surgical approach to complex anatomic areas of the skull base and also reduce the barrier of entry into endoscopy by surgeons trained with microscopic binocular vision.

E60. **WITHDRAWN** -- Incidence of Smell Disorders in Preoperative Patients Undergoing Nasal Surgery

John Stram, MD, Boston, MA
Christine Fayad, BS, Boston, MA
Jeffrey H. Spiegel, MD, Brookline, MA

Educational Objective: At the conclusion of this presentation, the participants should be able to describe the incidence of smell disorders in patients undergoing nasal surgery and the general population of asymptomatic individuals, and discuss the significance of perioperative smell testing.

Objectives: To preoperatively investigate the incidence of smell disorders in patients scheduled to undergo nasal, septal, and/or ethmoid sinus surgery in comparison to an asymptomatic population. **Study Design:** Prospective study of smell function in preoperative patients with symptomatic nasal complaints and asymptomatic patients. **Methods:** We conducted 2 smell tests on each study subject. The first test was a blinded coffee versus tea differentiation/identification exam and the second, a three item scratch test (UPSIT). Subjects that failed the scratch test were given the full 28 item UPSIT exam. Any patients that had failed either or both tests were informed of their anosmia via smell testing. All results were recorded according to the patient's symptoms and their subsequent surgical procedure. **Results:** We will report our findings and describe mechanisms by which the treating physician may protect him/herself from patients spuriously reporting anosmia/hyposmia postoperatively. With these methods, the preoperative smell function can be readily and economically assessed. **Conclusions:** Smell testing is an important component of perioperative assessment when considering nasal surgery.

E61. Surgical Management of Pneumosinus Dilatans Frontalis in the Setting of Chronic Rhinosinusitis

Abtin Tabaee, MD, New York, NY
Raj Shrivastava, MD, New York, NY
Daniel Buchbinder, MD DMD, New York, NY

Educational Objective: At the conclusion of this presentation, the participants should be able to discuss the surgical management of pneumosinus dilatans frontalis in the setting of chronic rhinosinusitis.

Objectives: Pneumosinus dilatans represents a rare lesion of unknown etiology in which progressive enlargement of an air filled paranasal sinus results in cosmetic and functional complications. Multiple theories have been described including partial outflow tract obstruction with ball-valve effect. The absence of pathologic mucosa has traditionally been considered a hallmark of this disorder. A case of pneumosinus dilatans frontalis in the setting of chronic rhinosinusitis is presented. **Study Design:** Case report. **Methods:** The clinical history, radiographic findings, surgical therapy and outcomes are presented. **Results:** A 24 year old male presented with 2 years of chronic rhinosinusitis and recurrent, acute episodes of severe forehead pain with worsening outward prominence of the frontal sinus during air travel. Computed tomography and findings at surgery were notable for diffuse nonpolypoid inflammatory changes of the paranasal sinuses, a type 4 frontal sinus cell and pneumosinus dilatans of the frontal sinus with severe deformity and thinning of the anterior table. A bicoronal approach was used for frontal sinus obliteration and cranioplasty. Functional endoscopic sinus surgery for the remaining paranasal sinuses was also performed. Followup at 6 months was notable for excellent cosmetic and functional results. **Conclusions:** To our knowledge, this is the first report of pneumosinus dilatans frontalis presenting in the setting of chronic rhinosinusitis. Surgical management of this disorder requires consideration of both the functional and cosmetic issues. The surgical technique and potential pathophysiologic considerations are discussed.
