

**The Program**

**of**

**The Ninety Second Annual Meeting**

**of**

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**THE AMERICAN  
BRONCHO-ESOPHAGOLOGICAL  
ASSOCIATION**

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**Wednesday and Thursday**

**April 18-19, 2012**

**Manchester Grand Hyatt  
San Diego, California**



## **PURPOSE**

The purpose of this program is to provide Otolaryngologists–Head and Neck Surgeons, Pulmonologists, Gastroenterologists and other interested physicians, clinicians, and scientists with an opportunity to update their knowledge of diseases involving the upper aerodigestive tract.

## **EDUCATIONAL OBJECTIVES**

- ◆ The aim of these scientific sessions is to provide physicians with up-to-date information pertinent to the clinical evaluation and endoscopic management of laryngeal, tracheobronchial, and esophageal disorders.
- ◆ Basic and clinical studies addressing structure function, and diseases of the aerodigestive tract, and disorders of swallowing, voice, and airways will be addressed.
- ◆ Special focus will be placed on issues relevant to laryngology.
- ◆ A variety of research regarding innovative techniques and instrumentation, as well as discussions of relevant illnesses and disorders associated with broncho-esophagology, will be presented for discussion.

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**EDUCATIONAL OBJECTIVES (cont.)**

**Disclosure Information**

In compliance with ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation. Please see the insert to this program for the complete disclosure list.

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ACS meetings may include presentations involving drugs or devices, or uses of drugs or devices that have not been approved by the FDA.

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## THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

### **Accreditation Statement**

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of the American College of Surgeons and the American Broncho-Esophagological Association. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

### **AMA PRA Category 1 Credits™**

The American College of Surgeons designates this live activity for a maximum of **7.25 AMA PRA Category 1 Credits™**. Physicians should claim only the credit commensurate with the extent of their participation in the activity.



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**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**12:30 PM**

**Wednesday, 18 April 2012**

**BUSINESS MEETING  
ABEA MEMBERS ONLY**

**Announcements**

**Introduction of New Members**

**Comments by Proposer**

**Presentation of ABEA Pins and  
Certificates**

**Election of Members**

**Active Members**

**Senior Members**

**Corresponding Members**

**Honorary Members**

**Associate Members**

**Granting of Senior Membership Status**

**Fifty-Year Certificates**

**In Memoriam**

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**John Frazer, MD**

**Loring Pratt, MD**

**Frank Ritter, MD**

**Peter Stradling, MD**

**Chester Weseman, MD**

**Election of Nominating Committee**

**Appointment of Auditing Committee**

**New Business**

**Old Business**

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**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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1945	Carlos E. Pitkin, MD
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2009	Andrew Blitzer, MD, DDS
2010	Michael Rothschild, MD
2011	Gregory N. Postma, MD

**PRESIDENT'S CIRCLE**

The ABEA is fortunate to count among its leadership those who have supported our science through the creation of the Presidents Circle and Leadership Funds.

Here, we recognize those whose gifts will ensure the ABEA's preeminent representation of advances in the science of laryngology and broncho-esophagology.

For further information on how you can also make a difference, please contact Clarence T. Sasaki, MD, Development, at [Clarence.Sasaki@yale.edu](mailto:Clarence.Sasaki@yale.edu) or call 203-785-2592.

List of contributors:

**Presidents Circle:**

Jonathan Aviv, Andrew Blitzer, Gady Har-El, Jamie Koufman, Clarence Sasaki, Peter Sasaki, Peak Woo, Eiji Yanagisawa, Steven Zeitels

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**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**1:00 PM**

**Wednesday, 18 April 2012**

**PRESIDENTIAL WELCOME**

**GREGORY N. POSTMA, MD**

*Augusta, GA*

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*New York, NY*

Presented by

**Gregory N. Postma, MD**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**1:12 PM**

**Wednesday, 18 April 2012**

**INTRODUCTION OF  
GUEST OF HONOR**

by Gregory N. Postma, MD

**GUEST OF HONOR**

**KIMINORI SATO, MD, PhD**

*Kurume, Japan*

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THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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**\* Indicates non-member**

**Wednesday, 18 April 2012**

**SESSION I**

**SWALLOWING / DYSPHAGIA**

**Moderator: Catherine R. Lintzenich, MD\***  
*Winston-Salem, NC*



1:15 PM

Wednesday, 18 April 2012

**High Speed Magnetic Resonance Imaging of Deglutition**

**Milan R. Amin, MD**

Cathy L. Lazarus, PhD\*

Stratos Achlatis, MD\*

Pippa Storey, PhD\*

Tovah Rosenberg, MA\*

Bidyut Pramanik, MD\*

Ryan C. Branski, PhD\*

Daniel Sodickson, MD, PhD\*

*New York, NY*

**Purpose:** To characterize the movements of pharyngeal structures during normal deglutition.

**Methods:** Twenty healthy volunteers underwent high-speed magnetic resonance (MR) imaging of the neck using a 3-Tesla scanner (Trio, Siemens Medical Solutions, Malvern, PA) with a 4-channel multichannel head coil, and a dual-channel neck coil during the act of deglutition. Each subject was asked to swallow multiple boluses of both thin liquids and pudding (5cc each). Turbo-FLASH sequence parameters were as follows: TR/TE 110/1.2 msec, slice thickness 10 mm, matrix 80 x 192, FOV 217 x 260 mm, parallel acceleration factor 2 (GRAPPA). Thirty sequential images were acquired over a duration of 3300 ms for each swallow. Imaging was performed in the midsagittal plane as well as in the axial plane at the level of the oropharynx and pharyngoesophageal segment. Axial images were then analyzed for changes in luminal area with the use of ImageJ software (NIH). Measurements of anterior-posterior as well as lateral excursion were recorded along with changes in luminal area. These results were analyzed using functional data analysis.

**Results:** All subjects tolerated the study without aspiration. Changes in pharyngeal wall excursion and luminal area were consistent within and between subjects and followed a definable sinusoidal pattern. Inter- and intra-rater reliability for the measurement tool was excellent. **Conclusions:** High-speed MR imaging of the swallow sequence is feasible and reliable. Data from this study of young healthy individuals may be used as a baseline for investigation of abnormal swallows.

TOPICAL BETHANECHOL FOR IMPROVEMENT OF  
ESOPHAGEAL DYSMOTILITY: A PILOT STUDY

**Ashli K. O'Rourke, MD\***

Paul M. Weinberger, MD\*

Gregory N. Postma, MD

*Augusta, GA*

Michele P. Morrison, DO\*

*Portsmouth, VA*

Jeffrey L. Conklin, MD\*

*Los Angeles, CA*

**Purpose:** We evaluated the effect of topically applied bethanechol in patients with ineffective esophageal motility (IEM) using high-resolution manometry (HRM). IEM has classically been defined as esophageal contractile pressures <30mmHg at either 5 or 10 cm above the lower esophageal sphincter (LES) in 30% of swallows. We hypothesized that bethanechol would improve esophageal smooth muscle contractility in these patients.

**Methods:** Adult patients with clinically diagnosed IEM underwent HRM. Ten 5 ml water bolus swallows were evaluated to establish a baseline level of esophageal function and confirm IEM diagnosis. A 5 mg dose of bethanechol was then delivered topically to the oropharynx and swallowed by the subject. Ten minutes after medication administration, ten additional 5 ml water bolus swallows were recorded to establish post-treatment effect.

**Summary:** Five patients were enrolled in this pilot study. At baseline, all subjects met criteria for IEM. After bethanechol administration, the average number of failed swallows decreased from 52.8% (range 10 - 90%) to 29.4% (range 0 - 50%). The number of peristaltic swallows at baseline averaged 28% (range 0 - 70%) and increased to average of 67.2% (range 50 - 80%) after medication administration. The distal contractile integral (DCI), which is an index of the contractile strength of the smooth muscle esophagus, increased from 178.3 mmHg.s.cm at baseline to 272.3 mmHg.s.cm. No adverse side effects were reported.

**Conclusions:** The clinical relevance of the changes noted after bethanechol administration are unknown, but encouraging. This warrants continued investigation with dose escalation in the future.

1:29 PM

Wednesday, 18 April 2012

SUCTION ABOVE THE CUFF TRACHEOTOMY TUBES  
REDUCE THE RATE OF VENTILATOR-ASSOCIATED  
PNEUMONIA IN INTENSIVE CARE UNIT PATIENTS

**Levi G Ledgerwood, MD\***

Moses D Salgado, MD\*

Peter C Belafsky, MD, PhD

*Sacramento, CA*

**Purpose:** Ventilator associated pneumonia (VAP) is a severe complication with a high degree of morbidity, mortality, and health care expenditure. Limiting the aspiration of oropharyngeal secretions should have a positive influence on the incidence of VAP. The purpose of this investigation was to evaluate the effect of suction immediately above the cuff tracheotomy tubes on the development of VAP.

**Methods:** Patients without a pre-existing pneumonia who required tracheotomy were randomly assigned to receive a tracheotomy tube with or without above-the cuff suction. Patients receiving a suction-above-the-cuff tube had 10mmHg continuous wall suction applied while the tracheotomy tube cuff was inflated. Data regarding the development of pneumonia, length of stay in the ICU, and time on ventilator were recorded and compared between groups.

**Results:** Eighteen patients were randomized and prospectively evaluated. Nine patients received control tubes and nine received suction tracheotomy tubes. 11% of suction tubes (1/9) and 56% of control tubes (5/9) developed pneumonia ( $p=0.03$ ). The mean length of ICU stay and the mean time on the ventilator for the suction tubes was 18 (+/- 15 SD) and 11 (+/-11 SD) respectively. The mean length of ICU stay and the mean time on the ventilator for the control tubes was 26 (+/-15 SD) and 18 (+/-14 SD) respectively. There was a trend toward decreased length of ICU stay and time on a ventilator for patients receiving the suction above the cuff tubes ( $p=0.14$  and  $p=0.12$  respectively).

**Conclusions:** Use of suction-above-the-cuff tracheotomy tubes significantly decreases the rate of VAP in ICU patients.

1:36 PM

Wednesday, 28 April, 2010

**BOTULINUM TOXIN INJECTION FOR THE  
TREATMENT OF CRICOPHARYNGEAL  
DYSPHAGIA: REVIEW OF A PATIENT SERIES**

**Elizabeth A. Kelly, MD\***

Ian J. Koszewski, BS\*

Joel H. Blumin, MD

Jonathan M. Bock, MD

*Milwaukee, WI*

Albert L. Merati, MD

*Seattle, WA*

**Purpose:** To review operative management and dysphagia outcomes in a series of patients with cricopharyngeal (CP) dysphagia treated with CP botulinum toxin (Botox) injection.

**Methods:** Patients with cricopharyngeal dysphagia were identified and a retrospective chart review was performed. Dysphagia-related quality of life questionnaires were mailed to patients based on the Eating Assessment Tool (EAT-10) and outcomes were completed. A systematic review of the published literature on CP botulinum toxin injections was also performed and compared to our data.

**Results:** 49 patients (33 female, 19 male, average age  $59 \pm 16$  years) with cricopharyngeal dysphagia were identified as having had CP botulinum toxin injections since the year 2000. 14 of these patients subsequently went on to have CP myotomy performed. Botox injections were often repeated, and Botox dose varied widely (average =  $39U \pm 19$ ). Overall complication rates were minimal, although many patients complained of transient worsening dysphagia after CP Botox injection and duration of effect was often limited. CP muscle biopsies were evaluated in a subset of CP Botox patients who proceeded to CP myotomy with mixed results of neuropathic, myopathic, and fibrotic histologic subtypes. EAT-10 scores demonstrated similar patient swallowing outcomes following CP Botox injection compared to a CP myotomy-alone subgroup analysis.

**Conclusions:** This study reviews findings from the largest published series of CP Botox injections and evaluates efficacy, patient satisfaction, and complications of this procedure. Dysphagia-related quality of life outcomes appear to be similar between CP Botox injection and CP myotomy.

**1:43 PM**

**Wednesday, 18 April 2012**

**OROPHARYNGEAL AND ESOPHAGEAL  
SWALLOWING IMPAIRMENT: ASSOCIATION AND  
PREDICTIVE VALUE OF MBSIMP AND COMBINED  
MII-EM**

**Jessica L Gullung, MD\***

Elizabeth G. Hill, PhD\*

Donald O. Castell, MD\*

Bonnie Martin-Harris PhD, CCC-SLP\*

*Charleston, SC*

Deglutition is a highly-integrated network of neural signaling and coordinated muscular contraction that begins with bolus preparation in the oral cavity and ends with closure of the lower esophageal sphincter following bolus passage. Any disturbance along this digestive pathway can cause symptoms of dysphagia. The goal of this study was to examine the relationship between measures of oropharyngeal function via modified barium swallow study (MBSS) and esophageal function via multichannel intraluminal impedance-esophageal manometry (MII-EM).

A retrospective review of patients who underwent both MBSS and MII-EM over a period of seven years at an academic institution was performed. MBSS components were scored using the Modified Barium Swallow Impairment Profile TM© (MBSImP TM©). Associations between impairment rates as measured by MBSImP TM© and MII-EM were assessed using two-sided Fischer's exact test.

One hundred sixty-four patients met inclusion criteria for the study. Comparison of MBSImP TM© component and oral and pharyngeal total regional scores to MII-EM scores revealed a significant association between abnormal esophageal clearance on MBSS (MBSImP TM© component 17) and abnormal MII-EM ( $p < 0.001$ ). Delay in initiation of pharyngeal swallow (MBSImP TM© component 6) was significantly associated with abnormal esophageal clearance (MBSImP TM© component 17) ( $p = 0.023$ ). The Oral Total regional score on MBSImPTM© was significantly associated with abnormal MII-EM ( $p = 0.039$ ).

Abnormal esophageal clearance on MBSS (MBSImP TM© component 17) indicates a need for further esophageal testing. A functional interrelationship between abnormalities in oropharyngeal and esophageal swallowing does exist, illuminating the importance of thorough pharyngoesophageal examination for dysphagia symptoms.

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**1:50 PM**

**Wednesday, 18 April 2012**

## **DISCUSSION**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**2:00 PM**

**Wednesday, 18 April 2012**

**BREAK WITH EXHIBITORS**

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

2:10 PM

Wednesday, 18 April 2012

**PANEL I**

**SPECTRUM OF CRICOPHARYNGEAL  
DYSFUNCTION**

**Moderator: Peter C. Belafsky, MD, PhD**  
*Sacramento, CA*

**Panelists:**

**Albert L. Merati, MD**  
*Seattle, WA*

**Joseph R. Spiegel, MD\***  
*Philadelphia, PA*

**Timothy M. McCulloch, MD**  
*Madison, WI*



**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**Wednesday, 18 April 2012**

**SESSION II**

**SWALLOWING / DYSPHAGIA**

**Moderator: Susan E. Langmore, PhD,  
CCC-SLP\***  
*Boston, MA*

THE UPPER ESOPHAGEAL SPHINCTER (UES) IS NOT  
ROUND: A PILOT STUDY EVALUATING A MORE  
PHYSIOLOGIC APPROACH TO UES DILATION

**Peter C. Belafsky, MD, PhD**  
*Sacramento, CA*

**Background:** Recent animal experiments from our lab suggest that the upper esophageal sphincter (UES) is not round and more approximates the shape of a kidney bean. Dilation with two cylindrical dilators provides a more physiologic distention of the UES.

**Purpose:** Pilot study evaluating the safety and efficacy of UES dilation with two simultaneous radial expansion balloon dilators.

**Methodology:** The charts of all persons undergoing dilation of the UES with two simultaneous radial expansion balloon dilators between 07/01/11 and 10/01/11 were retrospectively reviewed from a computerized database. Information regarding patient demographics, indications, and complications was abstracted. Efficacy was assessed with the 10-item eating assessment tool (EAT-10).

**Results:** Six patients underwent dilation with two simultaneous balloon dilators. The mean age of the cohort was 64 (+/-16) years. The indications for the procedure were radiation induced stenosis (n=4) and cricopharyngeus muscle dysfunction (n=2). There were no complications. The mean EAT-10 improved from 27 (+/- 12) to 14 (+/-8) post simultaneous dilation (p < 0.05).

**Conclusion:** Pilot data suggests that distention of the upper esophageal sphincter with two simultaneous controlled radial expansion balloon dilators is safe and effective. Future investigation is necessary to establish the safety in a larger cohort and to compare the efficacy to conventional dilation with just one dilator.

**REVISION ZENKER'S DIVERTICULUM:  
LASER VS. STAPLER OUTCOMES**

**Stewart I. Adam, MD\***

Boris Paskhover, MD\*

Clarence T. Sasaki, MD

*New Haven, CT*

**Purpose:** To analyze the utility of secondary endoscopic CO<sub>2</sub> laser and staple repair of recurrent Zenker's diverticulum (ZD) following previous endoscopic diverticulostomy.

**Methods:** Retrospective chart review of 11 patients with recurrent ZD. Medical records of patients with recurrent ZD after primary endoscopic repair were selected. Chart review data included method of repair (CO<sub>2</sub> laser or stapler), demographics (age and sex), size (cm), preoperative and postoperative symptoms, and complications. Dysphagia was graded on a modified FOIS 1-4 scale (1 - normal intake and 4 - severely limited/G-tube dependent). Regurgitation was also graded on a 1-4 scale (1 - no regurgitation and 4 - aspiration events).

**Results:** A total of 148 consecutive patients with ZD were primarily treated with endoscopic repair between 2000 and 2010. Eleven of these patients were revisions from failed primary endoscopic management, all done with stapler. Seven revision surgeries were performed by CO<sub>2</sub> laser and four by stapler repair. No difference was noted in patient age or defect size (laser 3.06 cm, stapler 2.75 cm). Length of stay and time to PO for the revision stapler patients were significantly increased (p-values of .029 & .009) compared to the primary staple group. Revision laser repairs had better postoperative regurgitation outcome scores than staple revision.

**Conclusions:** Secondary endoscopic repair for ZD recurrence is an effective treatment method. Better symptom outcomes were observed with secondary CO<sub>2</sub> laser repair compared to stapler revision. Advantages in shorter postoperative stay and time to PO with primary stapler repairs were nullified in revision stapler cases.

2:59 PM

Wednesday, 18 April 2012

**SUBGLOTTIC LARYNGEAL CLOSURE -A  
UNIQUE MODIFIED PROCEDURE OF  
LARYNGOTRACHEAL SEPARATION  
PREVENTING ASPIRATION**

**Naritomo Miyake, MD\***

Katuyuki Kawamoto, MD, PhD\*

Kazunori Fujiwara, MD, PhD\*

Yuji Hasegawa, MD\*

Hiroya Kitano, MD, PhD\*

*Koyama-cho, Tottori-shi, Japan*

**Purpose of the study:** Laryngotracheal separation (LTS) is one of the most ideal surgical procedures for intractable aspiration but one disadvantage of this procedure is that the oral side of the tracheal stump can break down. To address this problem, we decided to develop LTS further. We performed subglottic laryngeal closure (SGLC) as a new and safe surgical technique and evaluated it.

**Design and Method of Study and Analysis:** The study consisted of a retrospective analysis of the hospital records of patients who underwent SGLC between 2007 and 2011 obtained from Tottori University Hospital, Japan. 36 patients (27 males and 9 females) ranging in age from 15 to 91 years underwent SGLC. The following clinical data concerning the surgical procedures were examined: operative data (operative time, intra-operative bleeding time until drain removal), outcome (aspiration, changes in nutrition status), and complications. The occurrence of a subcutaneous fistula of the proximal laryngeal stump was evaluated by VF.

**Results:** All 36 patients underwent SGLC safely. Fistulation was observed in only one case (1/36, 2.8%). Small bleeding after the operation was observed in one case (1/36, 2.8%). Ultimately, the procedure relieved aspiration pneumonia in all our patients. SGLC was effective in 36(100%) of the patients.

**Conclusions:** SGLC is effective in the treatment and prevention of pulmonary aspiration. The incidence of postoperative complications is very low, especially the incidence of subcutaneous fistula. We thus conclude that this procedure is likely to be useful as a simple and safe alternative even in patients in poor condition.

3:06 PM

Wednesday, 18 April 2012

CAUSES AND DIAGNOSIS OF DYSPHAGIA  
IN A TERTIARY CENTER

**Monica Hoy, MD\***

*Calgary, Canada*

Amanda Domer, MD\*

Peter Belafsky, MD PhD

*Sacramento, CA*

Randall Loch, BA\*

*Linda Loma, CA*

**Background:** Dysphagia is common and costly. The potential causes of swallowing dysfunction are numerous and include reflux, head and neck cancer, stroke, among others. The most common causes of dysphagia in an outpatient tertiary swallowing center are uncertain.

**Purpose:** To determine the most prevalent causes of dysphagia presenting to an outpatient tertiary swallowing center and describe the diagnostic workup utilized to establish the diagnosis.

**Methods:** The charts of 100 consecutive patients presenting to a university outpatient tertiary swallowing center were retrospectively reviewed from an electronic database. Information regarding patient demographics, symptom survey scores, diagnostic workup, and diagnosis were abstracted and tabulated. The most common causes of dysphagia and the diagnostic workup utilized to establish the diagnoses were summarized.

**Results:** The mean age of the cohort (N=100) was 62 (range 34-91yrs). The cohort was 58% male and 42% female. The most common causes of dysphagia were reflux/esophagitis (27%), post-radiation dysphagia (14%), dysphagia not otherwise specified (13%), and cricopharyngeal dysfunction (11%). The mean VHI, RSI, and EAT-10 for the entire cohort was 11.2 (+/-10.1), 17.7 (+/-10.7), and 20.8 (+/-11.5) respectively. There was no difference in symptom survey scores between gender groups ( $p > 0.05$ ). The diagnostic workup included flexible laryngoscopy (71%, 17% with FEES), modified barium swallow (45%), esophagoscopy (35%), barium esophagography (21%), manometry (10%) and ambulatory pH testing (2%).

**Conclusion:** The most common causes of dysphagia presenting to an outpatient university swallowing center are reflux, post-radiation dysphagia and cricopharyngeal dysfunction. Flexible laryngoscopy, esophagoscopy and videofluoroscopy are the primary diagnostic modalities utilized.

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**3:13 PM**

**Wednesday, 18 April 2012**

**ASSESSMENT OF DYSPHAGIA IN ELDERLY  
PATIENTS WITH IDIOPATHIC  
UNILATERAL VOCAL FOLD PARALYSIS**

Nena Narajos, MD\*  
*Kumamoto Japan*

**WITHDRAWN**

**DISCUSSION**

**3:30 PM**

**Wednesday, 18 April 2012**

**PRESIDENTIAL CITATION FOR FOREIGN  
BODY MANAGEMENT**

Presented by Gresham Richter, MD

to

**Corbin Sullivan, MD**

**Management of Tertiary Bronchiole Foreign Body  
with Combined Rigid and Flexible Bronchoscopy**

**Corbin Sullivan, MD\***

Maria Wittkopf, MD\*

William Clarke, MD\*

Stephen Conley, MD\*

A 10-year-old otherwise healthy male was transferred to our institution from an outside hospital with a known right bronchial foreign body.

The patient was using a large sewing needle to pick dirt from under his fingernail on the day prior to admission and had placed the needle in his mouth while walking around his house. He experienced an episode of coughing and gagging and realized the needle was no longer in his mouth. He presented to an outside hospital where a chest radiograph (image 1) revealed a needle-shaped opacity in a right distal bronchus. The otolaryngologist at the outside institution attempted to remove the foreign body and was able visualize it using a rigid bronchoscope, but unable to reach it with optic forceps. The patient was subsequently transferred to our institution for definitive management.

Examination revealed a normal appearing patient in no distress, without stridor or stertor, with normal breath sounds and stable vitals saturating 99 to 100 % O<sub>2</sub> on room air. A repeat chest radiograph confirmed the needle-shaped opacity remained in the same position as the film taken previously. It appeared to be in a distal right lower lobe bronchiole (image 2). The patient's mother had been instructed to bring a similar sewing needle as an example, and it matched the shape of the opacity.



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The patient was urgently taken to the operating room where direct microlaryngoscopy and rigid bronchoscopy were performed. Exposure of the supraglottis was obtained using a Benjamin-Lindholm laryngoscope. Minimal trauma from the previous attempt at foreign body removal was identified. A 5.0 rigid ventilating bronchoscope was then advanced just proximal to the carina where ventilation was initiated.

Copious thick mucopurulent secretions were identified and suctioned from the right mainstem bronchus. The rigid bronchoscope was then advanced into the right mainstem bronchus and the bronchus intermedius, where further advancement was limited by the size of the bronchiolar lumen. The foreign body was not yet visualized at this point in the procedure.

The rigid telescope was then exchanged for a 2.6 mm flexible bronchoscope, which was advanced to the distal right lower lobe bronchioles. The foreign body was identified in a tertiary bronchiole as a sewing needle with the sharp tip pointing proximally. (video 1)

The 2.6mm flexible bronchoscope was then exchanged for a 4 mm flexible bronchoscope with a side port. An endoscopic flexible biopsy cup forceps was advanced through the side port and the foreign body was grasped at the tip with the cup forceps and withdrawn gently simultaneously with the flexible bronchoscope into the lumen of the rigid bronchoscope. The rigid bronchoscope, flexible bronchoscope, biopsy forceps and foreign body were then all withdrawn completely and mask anesthesia was resumed. (video 2) The foreign body was positively identified as an intact sewing needle.

Rigid bronchoscopy was then repeated to inspect the foreign body site. No evidence of bleeding or further foreign body was identified. (video 3) The patient was then masked and allowed to emerge from anesthesia and breathe spontaneously. He was sent to the floor for monitoring and discharged home the next day.

This case represents the novel use of combined rigid and flexible bronchoscope with side port in the management of a distal bronchiole foreign body and the importance of the cooperation and communication among the otolaryngology and anesthesiology teams.

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**Wednesday, 18 April 2012**

**SESSION III**

**AIRWAY**

**Moderator: Karen Zur, MD**  
*Philadelphia, PA*

**HIGH-FORCE SIMULATED INTUBATION  
FAILS TO DISLOCATE CRICOARYTENOID  
JOINT IN EX-VIVO HUMAN LARYNGES**

**Aaron D. Friedman, MD**

James B. Kobler, PhD\*

Tali Landau-Zemer, MD\*

Anca M. Barbu, MD\*

James A. Burns, MD

*Boston, MA*

**Purpose:** To assess the likelihood of arytenoid dislocation during intubation by applying controlled intubation forces to the arytenoid region.

**Methods:** Six cadaveric, human larynges (4 male, 2 female) were mounted in an apparatus for simulating forcible collision of an endotracheal tube with the arytenoid prominences. An endotracheal tube tip (ETT) with a stylet was used to push one arytenoid; a non-slip probe (NSP) was tested contralaterally. Increasing pressure was applied until the probes either slipped or reached 5kg of force. Dissection was then performed to assess cricoarytenoid capsule and ligament integrity. Forces obtained by pushing an ETT against an electronic balance were measured to estimate maximal possible intubating force.

**Results:** None of the ETT or NSP trials disrupted the cricoarytenoid joint capsule or ligament. Likewise, the joint never appeared to be dislocated or otherwise locked into an abnormal position. In ETT trials, the ETT slipped off the arytenoid at a mean force of 1.9kg. In NSP trials, the mean maximal force was 4.8kg. The mean maximal displacement of the force probes was 2.4cm (65% of the distance from the top of the arytenoid to the bottom of the cricoid). The mean maximal force achieved by pushing the ETT against a scale was 1.5kg (without stylet) and 4.6kg grams (with stylet).

**Conclusions:** The arytenoid could not be dislocated in any specimen. Arytenoid capsular and ligamentous disruption did not occur even when testing forces approximating the maximum force achievable under extreme conditions. Arytenoid dislocation thus seems unlikely to result from ETT insertion.

**CLINICAL MANIFESTATIONS AND  
TREATMENT PATTERNS OF IDIOPATHIC  
AND WEGENER'S GRANULOMATOSIS-  
ASSOCIATED SUBGLOTTIC STENOSIS**

**Stanford C. Taylor, MD\***

Daniel R. Clayburgh, MD PhD\*

James T. Rosenbaum, MD\*

Joshua S. Schindler, MD\*

*Portland, OR*

**Purpose:** To compare the manifestations and surgical management for subglottic stenosis (SGS) in patients with airway obstruction attributed to Wegener's Granulomatosis (WG) and those with idiopathic SGS (iSGS).

**Methods:** A retrospective review was performed on SGS patients with WG (diagnosed by positive ANCA, biopsy, or clinical presentation) and iSGS patients without identifiable cause seen in the otolaryngology department of an academic medical center between 2005 and 2010. Data were obtained on diagnosis, manifestation, and surgical treatment. Descriptive statistics and chi-squared analysis were performed ( $p < 0.05$  denoting significance).

**Results:** 40 patients were identified for the study, 25 with iSGS and 15 with WG-attributed subglottic airway obstruction. The cohort was followed for 192 patient-years. Average age of airway obstruction onset in WG patients was similar to those with iSGS (40.3 years and 46.0 years, respectively,  $p = 0.34$ ). No individuals with iSGS were male; 40% of WG-related stenosis patients were male ( $p < 0.01$ ). All patients with WG-associated obstruction received immunosuppressive therapy. Patients with iSGS had higher Myer-Cotton Staging at the time of dilation ( $p < 0.01$ ). Those with airway obstruction from WG underwent a mean of 0.47 surgical dilations per patient year of follow-up compared to 1.41 in those with iSGS ( $p = 0.01$ ).

**Conclusion:** While idiopathic and WG-associated airway obstruction occur at similar ages, iSGS occurs more often in females, presents with a greater degree of stenosis, and requires more dilations than WG-associated airway obstruction. Appropriate immunosuppression in patients with WG may be associated with the longer interval between procedures relative to patients with iSGS.

3:49 PM

Wednesday, 18 April 2012

**ASSESSING MORTALITY RISKS IN OBESE  
PATIENTS AFTER TRACHEOTOMY**

**Ryan Meacham, MD\***

Francisco Vieira, MD\*

*Memphis, TN*

**Purpose of the Study:** To evaluate both short and long-term mortality rates in obese and non-obese patients after tracheotomy. Because previous literature has not shown higher mortality rates of severely obese patients compared to mildly obese patients, this study also evaluated risk factors other than degree of obesity (i.e., tracheotomy indication, Charlson Comorbidity Index (CCI) score).

**Design and Methods:** Retrospective chart review was performed on all patients undergoing tracheotomy by the otolaryngology service from 2005-2010 at a county-subsidized level I trauma hospital.

**Summary of Results:** 200 tracheotomies were performed (146 non obese, 54 obese). Among obese patients, 31 had BMI 30-39 and 23 had BMI  $\geq$ 40. Ventilator Dependent Respiratory Failure (VDRF) comprised 56.8% of indications for non-obese patients compared to 83.3% among obese patients (P<.001). Mortality was higher at both 30 days and 1 year in obese (35.1%, 59.2%) compared to non-obese (19.2%, 42.5%) patients (P=.002), but mortality among BMI  $\geq$ 40 (26.1%, 52.2%) was not higher than BMI 30-39 (41.9%, 64.5%) patients (P=.41). Mortality for those receiving tracheotomy for VDRF was higher at 30 days (32.8%) and 1 year (57%) compared to those whose tracheotomy indication was non-VDRF (4.2%, 25%) (P<.001). Higher CCI scores had higher mortalities at 30 days (P=.08) and 1 year (P=.009) than those with lower CCI.

**Conclusions:** Although obesity confers a mortality risk after tracheotomy compared to non-obese patients, among obese patients degree of obesity does not correlate with mortality risk. Mortality among obese may be better assessed with tracheostomy indication and CCI score.

3:56 PM

Wednesday, 18 April 2012

THE EFFICACY OF BALLOON DILATATION  
OF THE PEDIATRIC AIRWAY

**Ian N. Jacobs, MD**

Megan Reinders, BA\*

Karen B. Zur, MD

*Philadelphia, PA*

Scott M. Rickert, MD

*New York, NY*

**Purpose:** To determine the success rate of airway balloon dilatation for various pathologies.

**Methods:** Prospective data collection of all children undergoing balloon dilatation of the airway during an 18-month period at a tertiary care children's hospital. Almost all procedures were performed with the Acclarent airway balloon. Data collected included signs/symptoms, site of lesion, etiology, grade, length, firmness, previous open surgery, adjuvant procedures, and glottic involvement. Outcome was considered successful if the stridor and airway symptoms resolved or if the patient was decannulated. The success rate was compared for these different parameters and statistical significance was determined by Fischer Exact Tests.

**Results:** 33 total patients underwent balloon dilatation during the 18-month period. Twenty-two dilations were for performed as a primary treatment, and 10 were performed after recent open airway surgery. Sites included subglottic (22), tracheal (8), esophageal (1), and nasal (2). Adjuvant treatment included sickle knife incision (13), microdebrider excision (4) and corticosteroid injection (5). Successful outcome was statistically associated with lower grades of stenosis, shorter length of stenosis, and lack of glottic involvement (all  $p < 0.05$ ). Outcome did not correlate with consistency of stenosis, number of dilatations, addition of adjuvant treatments or site of stenosis, except glottic involvement was associated with an inferior outcome.

**Conclusions:** Balloon dilatation is an effective and powerful tool for the pediatric airway both as a primary and postoperative treatment after open airway surgery. Further studies are needed to further optimize this technique.

4:03 PM

Wednesday, 18 April 2012

**TRANSORAL ROBOTIC SURGERY TONGUE  
BASE REDUCTION FOR OBSTRUCTIVE  
SLEEP APNEA: AN UPDATE**

**Jonathan M. Lee, MD\***

Gregory S. Weinstein, MD\*

Bert W. O'Malley, Jr., MD

Erica R. Thaler, MD\*

*Philadelphia, PA*

**Objective:** To report the updated results of transoral robotic surgery (TORS) tongue base reduction with uvulopalatopharyngoplasty for the surgical management of obstructive sleep apnea.

**Study Design:** Prospective, non-randomized trial.

**Methods:** Patients meeting indications for the surgical management of obstructive sleep apnea underwent diagnostic sleep endoscopy, transoral robotic surgery tongue base reduction with uvulopalatopharyngoplasty using the Da Vinci® Robotic Surgical System, and pre- and post-operative polysomnography. The primary endpoints are apnea hypopnea index (AHI), lowest oxygen saturation level, and Epworth Sleepiness Scale (ESS) score.

**Results:** Seventeen of twenty-two patients that have undergone TORS tongue base reduction with uvulopalatopharyngoplasty have completed pre- and post-operative polysomnography. The mean pre-operative AHI of 54.7 decreased by 54.8% to the mean post-operative AHI of 24.7 ( $p= 0.0027$ ), and the minimum oxygen saturation increased from the mean pre-operative value of 77.5% to the mean post-operative value of 81.8% ( $p= 0.0582$ ). The mean pre-operative ESS score of 13.1 decreased by 63.4% to the mean post-operative ESS score of 4.8 ( $p= 0.0144$ ), with a median follow-up time of 8 months. One patient had post-operative bleeding that required cauterization, resulting in a major complication rate of 4.5%.

**Conclusions:** TORS tongue base reduction with uvulopalatopharyngoplasty is a novel technique for the surgical management of obstructive sleep apnea, resulting in a significant decrease in AHI and a significant improvement in ESS score with an acceptable complication rate.

**SUPRAGLOTTIC STENOSIS: ETIOLOGY  
AND TREATMENT OF A RARE CONDITION**

**C. Blake Simpson, MD**

Matthew Stevens, MD\*

Andrew J. Chang, BA\*

*San Antonio, TX*

**Objective:** Although laryngotracheal stenosis (LTS) is well described in literature, the vast majority of cases pertain to stenosis at either the subglottic or glottic level. Supraglottic stenosis is an unusual subset of LTS that has distinctly different etiologies, associated symptoms and novel treatment options.

**Methods:** A retrospective chart review was conducted on eight patients at our institution diagnosed with supraglottic stenosis. All patients had follow-up of at least one year.

**Results:** The majority of the patients had a history of prior radiation therapy (62.5%) with the remaining cases related to autoimmune disorders. Our data reveal a frequent association with dysphagia (87.5%) to include two patients with coexisting pharyngoesophageal stricture and a substantial number (37.5%) requiring a percutaneous gastrostomy tube. The majority of the patients required more than one surgical intervention (87.5%) due to progressive/recurrent stenosis. While three patients underwent successful treatment with CO2 laser in the operating room, five others were successfully managed with pulsed-potassium titanyl phosphate (KTP) laser treatment in the clinic setting without complications. We observed two cases of acute intraoperative supraglottic edema in the setting of suspension laryngoscopy and jet ventilation, with one requiring emergent tracheostomy.

**Conclusions:** Supraglottic stenosis is a rare condition often associated with external beam radiation or autoimmune disorders. Although all patients experienced some degree of airway obstruction, the majority also had coexisting dysphagia. Although surgical treatment with CO2 laser in the operating room setting is a viable option, office-based treatment with pulsed-KTP laser appears to be an effective and potentially safer alternative.



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**4:10 PM**

**Wednesday, 18 April 2012**

**DISCUSSION**

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**4:27 PM**

**Wednesday, 18 April 2012**

**SENIOR DISCUSSANT:**

**PEAK WOO, MD**

*New York, NY*

**PANEL II**

**INSTITUTE OF LARYNGOLOGY AND  
VOICE RESTORATION PANEL**

**MANAGEMENT OF VOCAL FOLD  
KERATOSIS, DYSPLASIA AND  
CARCINOMA-IN-SITU**

**Moderator: James Burns, MD**  
*Boston, MA*

**Panelists:**

**Albert L. Merati, MD**  
*Seattle, WA*

**Andrew McWhorter, MD\***  
*Evanston, IL*

**Dennis H. Kraus, MD**  
*Baton Rouge, LA*

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**5:15 PM**

**Wednesday, 18 April 2012**

**ADJOURN**

**7:30 AM**

**Thursday, 19 April 2012**

**BUSINESS MEETING  
ABEA MEMBERS ONLY**

**Announcements**

**Report of Nominating Committee  
Election of New Officers**

**Report of the Treasurer**

**Audit Committee Report**

**Report of Secretary**

**Report of Editor  
Webmaster Report**

**Recognition of Departing Council Members**

**Old Business**

**New Business**

**Recognition of Departing Officers**

**Introduction of New President**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**Thursday, 19 April 2012**

**SESSION IV**

**ANIMAL MODEL INSIGHTS**

**Moderator: Michael M. Johns, III, MD**  
*Atlanta, GA*

8:00 AM

Thursday, 19 April 2012

**RABBIT MODEL OF VOCAL FOLD  
VIBRATION**

**Jennifer Long MD, PhD \***

Ming Ye\*

Gerald Berke, MD

Dinesh Chhetri, MD

*Los Angeles, CA*

**Objectives:** A small animal model for in vivo study of the larynx is desirable. The rabbit has been a successful model for vocal fold scarring, and can produce evoked phonation. However, the vibratory characteristics of the rabbit vocal folds have not been reported. We present the stroboscopic mucosal wave in a rabbit model.

**Methods:** New Zealand white rabbits were anesthetized via tracheotomy. The larynx was elevated and supraglottic structures excised for exposure. Phonation was attempted by electrical neuromuscular stimulation or by manual compression of the thyroid cartilage during transglottic airflow. Vocal fold vibrations were viewed and recorded via stroboscopic light.

**Results:** Phonation was achieved most reliably with manual adduction via pressure on the external thyroid cartilage during transglottic airflow. Stimulation of the recurrent laryngeal nerves produced abduction due to the rabbit's dominant innervation to the posterior cricoarytenoid muscles. Needle electrode stimulation of the thyroarytenoid and cricothyroid muscles did produce phonation but worsened local edema. Mucosal wave as viewed by stroboscopy proceeded from inferior to superior and was similar in quality to human vocal fold vibration.

**Conclusions:** The rabbit is a versatile small animal model for evoked phonation. Vibratory characteristics can be studied with or without neuromuscular control. Sound production occurs via the mucosal wave, consistent with mechanisms for humans and other mammals.

**RECURRENT LARYNGEAL NERVE  
TRANSECTION AND ANASTOMOSIS:  
LARYNGEAL MOTONEURON  
SURVIVAL AND THE EFFECT OF THE  
ANASTOMOSIS SITE**

**Michael J Pitman, MD**

Aaron Bender, BS\*

Sansar Sharma, PhD\*

Steven Schaefer, MD\*

*New York, NY*

**Purpose of the Study:** To investigate the quantity of recurrent laryngeal nerve motoneuron (RLMN) surviving 16 weeks after transection and anastomosis of the rat recurrent laryngeal nerve (RLN) as well as investigating the impact of the anastomosis site on regeneration and RLMN labeling.

**Design and Method of Study and Analysis:** Ten Sprague Dawley rats underwent right RLN transection and anastomosis. After 16 weeks, Fluororuby (FR) was applied to the RLN freshly transected proximal or distal to the anastomosis site, with five rats in each group. Brainstems were harvested after seven days and the nucleus ambiguus was evaluated for labeled RLMN. RLMN labeled after application of FR proximal to the anastomosis averaged 147 (138-158) while those labeled after application of FR distal to the anastomosis averaged 146 (128-169).

**Summary:** The number of RLMN stained after RLN transection, anastomosis and regeneration is consistent with studies quantifying the total number of RLMN in the rat nucleus ambiguus. This suggests that most RLMN survive after RLN transection and anastomosis. The quantity of labeled RLMN was similar whether the FR was applied proximal or distal to the anastomosis, implying that most of the viable axons present proximal to the anastomosis crossed into the distal nerve.

**Conclusion:** Rat RLMN survive nerve transection, anastomosis and regeneration. The anastomosis site does not significantly impede retrograde transport or axonal regeneration and most of the viable axons traverse the anastomosis.



8:14 AM

Thursday, 19 April 2012

**ANIMAL MODEL FOR RECURRENT  
LARYNGEAL NERVE SYNKINETIC  
REINNERVATION WITH IMMOBILE VOCAL  
FOLD USING SILICON TUBE**

**Yoshihiko Kumai, MD, PhD\***

Takashi Aoyama, MD, PhD\*

Kohei Nishimoto, MD\*

Yutaka Toya, MD\*

Tetsuji Sanuki, MD, PhD\*

Eiji Yumoto, MD, PhD\*

*Kumamoto, Japan*

**Background/Objectives:** Clinically, persistent vocal fold immobility following recurrent laryngeal nerve (RLN) injury is known to be due to synkinetic reinnervation. However, animal model for RLN reinnervation presenting the persistent immobile vocal fold has not been established. This study aimed to establish this rat model using silicon tube.

**Study Design/Methods:** We used nine rats in total. The left RLN was transected and the stumps were abutted in the silicon tube with 1mm interspace inducing regeneration. At 5, 10, 15 weeks following this procedure; 1) Mobility of vocal fold was examined endoscopically. 2) Reinnervation was assessed by quantitative immunohistological evaluation using anti-neurofilament (NF) antibody of for both proximal and peripheral side of the nerves to the silicon chamber and histological assessment of atrophy of the thyroarytenoid (TA) muscle. 3) Electromyography of the TA muscle was performed.

**Results:** All animals presented the fixed left vocal folds throughout the course. The average NF expression in both the peripheral and proximal side of the nerves to the silicon tube, the ratio of the muscle area and the action potential in the untreated/treated side of the TA muscle, increased significantly ( $P<0.05$ ), especially between 10 and 15 weeks, demonstrating the regeneration through the silicon tube.

**Conclusion:** We established the animal model for synkinetic reinnervation of RLN with immobile vocal fold using silicon tube. Efficacy of treatments for RLN injury including surgical and medical procedures should be assessed using this model which follows the exact clinical course of synkinetic reinnervation in patients.

**QUANTITATIVE DISTINCTION OF UNIQUE  
VOCAL FOLD SUB-EPITHELIAL  
ARCHITECTURE USING OPTICAL  
COHERENCE TOMOGRAPHY**

**Steve Maturo, MD\***

*San Antonio, TX*

Shilpa Ojha, MD\*

Jennifer Setlur, MD\*

Christopher Hartnick, MD

*Boston, MA*

Benboujja Fouzi, MD\*

Caroline Boudoux, MD\*

*Montreal, Canada*

**Objective:** The primary objective of this study was to quantitatively analyze ex vivo porcine, fetal human and adult human vocal folds using Optical Coherence Tomography (OCT). A secondary objective was to quantitatively discriminate between a one, two, and three layer lamina propria structure.

**Methods:** Analysis of the vocal folds of 10 adult pigs, 10 adult human, and 5 fetal vocal fold specimens using OCT and histologic techniques. Quantitative comparison of OCT results and histology.

**Results:** OCT allowed for the visualization of the sub-epithelial vocal fold architecture of all imaged tissue. OCT imaging revealed distinct characteristic signal intensity for each type of specimen.

**Conclusion:** OCT has been developed for the use of in vivo imaging of biological micro-structures. This study demonstrates the ability of OCT to differentiate between the vocal fold architecture of three histologically distinct vocal folds. We believe that this study will help identify in vivo, sub-epithelial changes of the human vocal fold in pathologic process and aid in determining the changes of the maturing pediatric vocal fold as it develops from a monolayer to tri-layer structure.

**8:28 AM**

**Thursday, 19 April 2012**

**DISCUSSION**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

Thursday, 19 April 2012

**SESSION V**

**ONCOLOGY**

**Moderator: Paul F. Castellanos, MD**  
*Birmingham, AL*

8:38 AM

Thursday, 19 April 2012

IMPROVED VOICE OUTCOMES FROM SUBLIGAMENOUS  
EXCISION OF EARLY GLOTTIC CANCER

**Alexander T. Hillel, MD**

Michael M. Johns, MD

Pedro Badia, MD\*

Melissa M. Statham, MD

Adam M. Klein, MD

*Atlanta, GA*

**Purpose:** To evaluate voice and stroboscopy outcomes in deep European Laryngological Society (ELS) type I (to the ligament with no remaining superficial lamina propria) and type II (subligamentous) cordectomies for early glottic cancer.

**Design and Methods:** Medical records of patients with the diagnosis, glottic carcinoma were reviewed at a tertiary care medical center between 2005 and 2011. Patients were stratified into ELS type I and type II groups. Data included age, gender, surgeon, tumor stage, and VRQOL. Stroboscopy was reviewed. Statistical analysis was performed with student t-test.

**Results:** 17 patients were identified, 4 (mean age 62.3 years) with surgical excision to the ligament and 13 (mean age 61.5 years) with subligamentous excision to the thyroarytenoid muscle. The average postprocedure VRQOL was 12 for the ELS 2 group and 27 for the ELS type I cohort. All patients in the ELS I group had a severely reduced or absent mucosal wave and 75% had glottic insufficiency, while the average mucosal wave was mild-moderately reduced in the ELS 2 cohort with 31% demonstrating glottic insufficiency. On average the ELS 1 group had moderate supraglottic hyperfunction while the ELS 2 group had mild hyperfunction. Survival outcomes were the same in both cohorts.

**Discussion:** Patients undergoing subligamentous excision of early glottic cancer had significantly improved voice QOL outcomes ( $p=0.001$ ) and stroboscopy ( $p=0.007$ ) scores with similar survival outcomes. That suggests that if SLP cannot be preserved, patients have better voice outcomes with excision of the ligament and maintain glottic sufficiency.

8:45 AM

Thursday, 19 April 2012

**ENDOSCOPIC SUBMUCOSAL DISSECTION FOR  
EARLY LARYNGO-PHARYNGEAL CANCER  
DETECTED BY NARROW BAND IMAGING  
TECHNOLOGY**

**Ichiro Tateya, MD, PhD**

Manabu Muto, MD, PhD\*

Shuko Morita, MD\*

Shin-ichi Miyamoto, MD\*

Shigeru Hirano, MD, PhD

Morimasa Kitamura, MD\*

Shinpei Kada, MD, PhD\*

Takatoshi Inaoka, MD\*

Juichi Ito, MD, PhD \*

*Kyoto, Japan*

Laryngopharyngeal cancer is often advanced when detected and has relatively poor prognosis. We have previously reported that narrow band imaging (NBI) combined with magnifying endoscopy is useful in detecting early superficial laryngopharyngeal cancers, which are difficult to detect with a standard endoscopy. For such cases, we are applying endoscopic submucosal dissection technique which is increasingly used for early esophageal cancer. In this study, we investigated the usefulness of endoscopic submucosal dissection for early laryngopharyngeal cancer. Under general anesthesia, specially designed curved laryngoscope was inserted to allow a working space in the pharyngeal lumen and magnifying endoscopy was inserted transorally to visualize the field. The extent of the lesion was determined by NBI and iodine staining. After hydrodissection, a circumferential incision into the submucosa was performed around the lesion and the lesion was dissected from the laryngopharyngeal wall. Cutting and dissection procedure was performed either with specialized endoscopic electric knife or with orally inserted curved electric knife. Since September 2007, 99 cancer lesions, including 76 lesions in the hypopharynx, 20 lesions in the oropharynx, and 3 lesions in the larynx, were treated with this procedure. Post operative bleeding occurred in one case and spontaneous subcutaneous emphysema occurred in 7 cases. With a median follow-up period of 21 months, all patients retain their pharynx and their speaking, breathing, and swallowing functions and survive with no evidence of disease. Endoscopic submucosal dissection can be a new strategy for early laryngopharyngeal cancer detected by NBI technology.

**VOICE OUTCOMES FOR  
PHOTOANGIOLYTIC KTP LASER  
TREATMENT OF EARLY GLOTTIC ANGER**

**Aaron D. Friedman, MD**

Robert E. Hillman, PhD\*

James A. Burns, MD

Steven M. Zeitels, MD

*Boston, MA*

**Purpose:** Surgery and radiotherapy routinely provide very high cure rates when treating early glottic cancer. Therefore, key metrics for success are optimal voice outcome and preservation of future cancer treatment options. Remarkably, there is a paucity of pre-treatment and post-treatment voice-outcome data. Angiolytic KTP laser treatment of early glottic cancer with ultra-narrow margins was designed as a strategy to better preserve glottal function. Although effective oncologic results have been achieved, substantial vocal-outcome data has not yet been reported.

**Methods:** Pre-treatment and post-treatment voice outcome data were obtained for 72 patients (T1a-43, T1b-8, T2a-2, T2b-19) who underwent photo angiolytic 532nm KTP-laser treatment of early glottic cancer. Evaluations included objective measures (acoustic and aerodynamic) and patients'™ self-assessments of vocal function (Voice-Related Quality of Life). Analyses were done based on dividing the study sample into T1 and T2 groups.

**Results:** There were statistically significant ( $p < 0.01$ ) post-operative improvements for acoustic measures of voice quality (perturbation and signal-to-noise) and self-assessments of vocal function for both groups. Average acoustic values for the T1 group more closely approximated normative thresholds. A post-operative estimate of average aerodynamic vocal efficiency demonstrated a normal level for the T1 group, but fell slightly below the normative threshold for the T2 group.

**Conclusions:** This investigation provides unique pre-treatment and post-treatment voice outcome data resulting from the management of early glottic cancer. It revealed that angiolytic KTP laser treatment of early glottic cancer with ultra-narrow margins was an effective strategy for voice preservation. Furthermore, radiotherapy was preserved as an oncologic treatment option.

8:59 AM

Thursday, 19 April 2012

**AORTIC HOMOGRAFT RECONSTRUCTION OF  
WIDE-FIELD PARTIAL LARYNGECTOMY  
DEFECTS: A NEW TECHNIQUE**

**Steven M. Zeitels, MD**

John C. Wain, MD\*

Anca M. Barbu, MD\*

James A. Burns, MD

*Boston, MA*

Paul C. Bryson, MD\*

*Cleveland, OH*

**Purpose:** Wide-field transcervical partial-laryngectomy (TPL) for cancer with significant subglottic extension often precludes tracheotomy decannulation and is done infrequently today. This is primarily due to the popularity of chemotherapy-radiotherapy treatment regimens and limited enthusiasm for TPL after failed radiotherapy. Consequently, we designed a new reconstructive technique for TPL to preserve function and provide an alternative for total laryngectomy.

**Materials/Methods:** A retrospective examination of 15 patients who underwent single-stage wide-field TPL with cryopreserved aortic-homograft reconstruction was done; 8/15 had failed prior radiotherapy. At least 40% of the cricoid circumference was resected in 8/15.

**Results:** All 15 had their tracheotomy tube decannulated and retained laryngeal phonation, while 14/15 resumed oral intake. There were no major surgical complications, however, minor problems such as excessive granulation were commonplace mirroring the experience with endoscopic laser resections.

**Conclusion:** Aortic homograft is a reliable versatile reconstructive option for performing wide-field partial laryngectomy that allows for preservation of voice, an adequate airway caliber, and swallowing for selected cases when extended partial laryngectomy is oncologically appropriate. Apart from excellent functional aerodigestive outcomes, technical advantages of this approach include: 1. the mechanical properties (stiffness) of the soft-tissue graft substrate as a scaffold for the airway, 2. the lack of graft immunogenicity, and 3. the robust incorporation of the aortic homograft into local soft tissues despite being avascular and being exposed to barotrauma from coughing. We are optimistic that a wide variety of surgical uses for cryopreserved arterial homografts as an organic soft-tissue substrate will likely evolve given the evidence herein.



**DISCUSSION**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

**Thursday, 19 April 2012**

**SESSION VI**

**REGENERATION MEDICINE**

**Moderator: Martin A. Birchall, MD**  
*London, England*

**Thursday, 19 April 2012**

**BROYLES-MALONEY AWARD**

The Broyles-Maloney Award was established to encourage advancement of the art and science of bronchoesophagology and closely related subjects. Competition for the award is limited to persons whose abstracts are submitted for inclusion in the Annual Scientific Program. The award is given for outstanding manuscript, thesis or accomplishments in bronchoesophagology, laryngology or related science.

**RECIPIENTS OF THE  
BROYLES-MALONEY THESIS AWARD:**

1988	Richard A. Kosarek, MD
1989	(no award)
1990	Thomas F. Dowling, MD Jamie Koufman, MD
1991	(no award)
1992	(no award)
1993	Jos. J.M. van Overbeek, MD, PhD
1994	Steven D. Gray, MD
1995	Jonathan E. Aviv, MD John H. Martin, PhD Ralph Sacco, MD Beverly Diamond, PhD Andrew Blitzer, MD, DDS
1996	(no award)
1997	Ira Sanders, MD Liancai Mu, PhD
1998	Nancy M. Bauman, MD Degiang Wang, MD Eric S. Luschei, PhD Debra M. Jaffe, MD
1999	Robert Berkowitz, FRACS Qi-Jian Sun, PhD John Chalmers, PhD Paul Pilowsky, PhD
2000	Asif Amirali, MD Greg Tsai, MD Nicole Schrader, MD Donald Weisz, PhD Ira Sanders, MD
2001	(no award)
2002	Shin-ichi Kanemaru, MD Hisayoshi Kojima, MD Akhmar Magrufov, MD Koichi Omori, MD Yasuyuki Hiratsuka, MD Shigeru Hirano, MD

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	Juichi Ito, MD
	Yasuhiko Shimizu, MD
2003	Ira Sanders, M.
2004	Clarence T. Sasaki, MD
2005	Tomoko Tateya, MD
	Ichiro Tateya, MD, PhD*
	Diane M. Bless, PhD*
2006	(No award)
2007	J. Scott McMurray, MD
	Charles N. Ford, MD
	Nadine P. Conner, MD*
2008	Tina L. Samuels, MS*
	Ethan Handler*, BS*
	Michael L. Syring, BS*
	Joel H Blumin, MD
	Joseph E Kershner, MD
	Nikki Johnston, PhD*
2009	Nikki Johnston, PhD*
	Clive W. Wells*
	Tina Samuels, MS*
	Joel Blumin, MD
2010	Sandeep Karajanagi, PhD*
	Gerardo Lopez-Guerra, MD*
	Hyoungshin Park, PhD*
	James B. Kobler, PhD*
	Daryush D. Mehta, SM*
	Yoshihiko Kumai, MD, PhD*
	James T. Heaton, PhD*
	Victoria L. M. Herrera, MD*
	Robert E. Hillman, PhD*
	Steven M. Zeitels, MD
2011	Mikhail Wadie, MD*
	Juan Li, MD*
	Clarence T. Sasaki, MD
2012	Satoshi Ohno, MD*
	Shigeru Hirano, MD, PhD
	Shin-ichi Kanemaru, MD, PhD*
	Masanobu Mizuta, MD*
	Seiji Ishikawa, MD*
	Ichiro Tateya, MD, PhD
	Tatsuo Nakamura, MD, PhD*
	Juichi Ito, MD, PhD*

Thursday, April 19, 2012

**BROYLES-MALONEY AWARD**

**Presenter: Gregory N. Postma, MD**

**Recipient:  
Satoshi Ohno, MD**

**ROLE OF CIRCULATING  
MESENCHYMAL STEM CELLS IN  
VOCAL FOLD WOUND HEALING**

**Satoshi Ohno, MD\***

Shigeru Hirano, MD, PhD

Shin-ichi Kanemaru, MD, PhD\*

Masanobu Mizuta, MD\*

Seiji Ishikawa, MD\*

Ichiro Tateya, MD, PhD

Tatsuo Nakamura, MD, PhD\*

Juichi Ito, MD, PhD\*

*Kyoto, Japan*

**Purpose of the study:** Vocal fold wound can cause intractable scarring, resulting in dysphonia. It is essential to understand wound healing process for the treatment of the vocal fold scarring. Mesenchymal stem cells (MSC) have great therapeutic potential in wound healing. They consistently circulate in the peripheral blood and migrate into the wound site, showing regenerative effects. However, their roles in vocal fold wound are poorly understood because they are few in the peripheral blood and there is no specific marker of MSC. The present study evaluates how intravenously transplanted MSC act in wound healing in the vocal folds, using GFP-labeled MSC.

**Design and Method of Study and Analysis:** GFP-labeled MSC were obtained from the femurs of SD-Tg(CAG-EGFP) Rats and incubated. Sprague Dawley Rats underwent intravenous transplantation of GFP-labeled MSC ( $1.0 \times 10^6$  cells) just after vocal fold injury. Histological examination was performed.

**Summary of results:** Transplanted MSC were distributed at the wound edge of the vocal fold from day 1. MSC-transplanted vocal folds showed better wound healing, compared to the sham-treated folds.

**Conclusions:** Circulating MSC can migrate into the wound site of the vocal folds. They are considered to play a significant role in wound healing of the vocal folds.

9:23 AM

Thursday, 19 April 2012

**STEVEN D. GRAY RESIDENT AWARD**

The Steven Dean Gray Resident Award was established as part of the continuing legacy of Dr. Gray in order to recognize excellence in resident research in both laryngology and bronchoesophagology.

**RECIPIENTS OF THE  
STEVEN D. GRAY RESIDENT AWARD**

2003	Sarah Hodges, MD Randal Leung, MBBS
2004	Seth Cohen, MD Jonathan P. Lindman, MD
2005	Grace SY Yang, MD
2006	None
2007	Tsunehisa Ohno, MD
2008	J. Matthew Dickson, MD
2009	Wataru Okano, MD
2010	None
2011	None
2012	Koshi Otsuki, MD

9:23 AM

Thursday, 19 April 2012

**STEVEN D. GRAY RESIDENT AWARD**

**Presented by Gregory N. Postma, MD**

**REGENERATION OF RESPIRATORY  
EPITHELIUM-LIKE TISSUE FROM  
INDUCED PLURIPOTENT STEM CELLS**

**Koshi Otsuki, MD\***

Mitsuyoshi Imaizumi, MD\*

Yukio Nomoto, MD\*

Ikuo Wada, PhD\*

Masao Miyake, PhD\*

Takashi Sugino, MD\*

Koichi Omori, MD\*

*Fukushima, Japan*

**Purpose:** In cases of laryngeal inflammatory lesion or tracheal invasion of malignant tumor, autologous tissue implantation techniques using skin or cartilage have been applied, however, these techniques are invasive and unstable. In regenerative medicine, embryonic stem cells had the problems of immune rejection and ethical issue. The use of induced Pluripoten Stem (iPS) cells is expected to avoid these problems. In our current study, induction of tracheal epithelium from mouse iPS cells was examined in serum-free medium using several growth factors.

**Design and Method:** iPS cells were cultured on a gelatin-coated dish in the presence of serum. For induction of differentiation, undifferentiated cells were completely dissociated to single cells. iPS cells were seeded in low-attachment plates for generation of embryoid body (EB) in the serum-free medium. After 3



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days culture, EB was transferred to gelatin-coated dish supplemented with activin A and b-FGF (induction group). As a control, EB was cultured in the presence of serum without these growth factors (control group). Cultured tissues in both groups were histologically examined for two weeks.

**Results:** In the control group, regeneration of respiratory epithelium was not observed. After 9 days culture, spontaneously beating spheres like cardiomyocytes was observed in part of EB. In the induction group, the presence of respiratory epithelium-like tissue was observed after 14 days culture by hematoxylin eosin staining and immune staining.

**Conclusions:** Our study demonstrated that iPS cells had the potential to differentiate into the respiratory epithelial cells, as shown by the appearance of histological examination.

9:30 AM

Thursday, 19 April 2012

**INVESTIGATION OF THE LOCALIZATION OF  
REACTIVE OXYGEN SPECIES DURING WOUND  
HEALING OF VOCAL FOLDS IN A RAT MODEL**

**Masanobu Mizuta, MD\***

Shigeru Hirano, MD, PhD

Satoshi Ohno, MD\*

Ichiro Tateya, MD, PhD

Shin-ichi Kanemaru, MD, PhD\*

Juichi Ito, MD, PhD\*

*Kyoto, Japan*

**Purpose of the study:** Previous studies indicate that appropriate wound healing requires a delicate balance between oxidative stress and antioxidants. While normal wound healing requires low levels of reactive oxygen species (ROS), an overexposure to ROS known as oxidative stress leads to impaired wound healing, which in vocal folds may result in a dysphonia due to scarring which is difficult to treat. However, the role, the existence and the localization of ROS during the wound healing of vocal folds haven't been investigated to date. In this study we assessed the expression and the localization of ROS in injured vocal folds using immunohistochemistry.

**Design and Method of Study and Analysis:** Vocal folds were injured unilaterally in Sprague-Dawley rats by splitting the mucosa under transoral rigid endoscopy. The larynges were harvested at each time point after the injury and examined by immunostaining for 4-hydroxynonenal (4-HNE) which is oxidative stress markers for lipid peroxidation.

**Results:** The number of 4-HNE-immunoactive cells was significantly increased in the injured vocal folds compared to those in the normal vocal folds at day 3. The 4-HNE-immunoactive cells were localized at the middle portion of the thyroarytenoid muscle, the epithelium, and the lamina propria.

**Conclusions:** The current study shows the existence and the localization of ROS in injured vocal folds.

**9:37 AM**

**Thursday, 19 April 2012**

**VOCAL FOLD STEM CELLS AND THEIR  
NICHE IN THE HUMAN VOCAL FOLD**

**Kiminori Sato, MD, PhD**

Hirohito Umeno, MD

Tadashi Nakashima, MD

*Kurume, Japan*

**Purpose:** Adult tissue-specific stem cells have the capacity to self-renew and generate functional differentiated cells that replenish lost cells throughout an organism's lifetime. Tissue-specific stem cells reside in a niche, whereby a complex microenvironment maintains their multipotency. Vocal Fold Stellate Cells (VFSCs) in the maculae flavae (MFs) have many morphological differences compared with conventional fibroblasts in the human vocal fold. The VFSCs express proteins of all three germ layers. It is uncertain whether the VFSCs derived from the same embryonic source as conventional fibroblasts in the human vocal fold.

**Purpose of this Study:** To investigate the stemness of the VFSCs and whether the pericellular matrices in the MFs are a hyaluronan-rich matrix, which is required for a stem cell niche.

**Methods:** Paraffin-embedded specimens were stained with Alcian blue (pH2.5) with hyaluronidase digestion study. Immunoreactivity to antibodies directed to CD44, CD133, Oct-4, and Ki67 was investigated in five human adult vocal fold mucosae.

**Results:** The VFSCs were resting cells (G0-phase) and expressed a mesenchymal stem cell marker. The VFSCs did not express hematopoietic and embryonic stem cell markers. The hyaluronan concentration in the MFs was high and the VFSCs expressed hyaluronan receptors, indicating that MFs are characterized by a certain criteria of hyaluronan-rich pericellular matrix.

**Conclusions:** There is growing evidence that the VFSCs in the human MFs are somatic (mesenchymal) stem cells or

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progenitor cells of the vocal fold, and MFs can be a candidate for the stem cell niche, which are a microenvironment nurturing a pool of VFSCs.

**9:44 AM**

**Thursday, 19 April 2012**

**DISCUSSION**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

**9:5 AM**

**Thursday, 19 April 2012**

**BREAK WITH EXHIBITORS**

**Thursday, 19 April 2012**

**RECOGNITION OF  
CHEVALIER JACKSON AWARD RECIPIENTS  
1959-2012**

1959	Louis H. Clerf, MD
1960	(no award)
1961	Herman J. Moersch, MD
1962	Paul H. Holinger, MD
1963	Edwin N. Broyles, MD
1964	Leroy A. Schall, MD
1965	Herbert W. Schmidt, MD
1966	Paul G. Bunker, MD
1967	Joel Pressman, MD
1968	Verling K. Hart, MD
1969	Joseph P. Atkins, MD
1970	Anderson C. Hilding, MD
1971	Robert M. Lukens, MD
1972	Charles M. Norris, MD
1973	Arthur M. Olsen, MD
1974	Charles F. Ferguson, MD
1975	Shigeto Ikeda, MD
1976	Blair W. Fearon, MD
1977	Francis W. Davidson, MD
1978	Seymour R. Cohen, MD
1979	M. Stuart Strong, MD
1980	DeGraff Woodman, MD
1981	Albert H. Andrews Jr., MD
1982	Gabriel F. Tucker, Jr., MD
1983	Howard A. Andersen, MD
1984	Paul H. Ward, MD
1985	Bruce N. Benjamin, MD
1986	Loring W. Pratt, MD
1987	Robert S. Fontana, MD
1988	Charles W. Cummings, MD
1989	Bernard R. Marsh, MD
1990	David R. Sanderson, MD
1991	William W. Montgomery, MD
1992	John A. Tucker, MD
1993	Gerald B. Healy, MD
1994	Vincent J. Hyams, MD
1995	Lauren D. Holinger, MD
1996	Stanley M. Shapshay, MD
1997	Robert H. Ossoff, MD
1998	John Frederickson, MD

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1999 Eiji Yanagisawa, MD  
2000 William W. Montgomery, MD  
2002 Jack L. Gluckman, MD  
2003 Ellen M. Friedman, MD  
2004 Robin T. Cotton, MD  
2005 Charles W. Vaughn, MD  
2006 Andrew W. Blitzer, MD, DDS  
2007 Gayle E. Woodson, MD  
2008 Robert J. Toolhill, MD  
2009 Peter J. Koltai, MD  
2010 Clarence T. Sasaki, MD  
2011 Peak Woo, MD  
2012 W. Frederick McGuirt, Sr., MD

**CHEVALIER JACKSON AWARD**

**Presenter: Gregory N. Postma, MD**

**Recipient:**

**W. Frederick McGuirt, Sr., MD**

*Winston-Salem, NC*



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**10:07 AM**

**Thursday, 19 April 2012**

**. INTRODUCTION OF THE CHEVALIER  
JACKSON LECTURER**

**Presenter: Gregory N. Postma, MD**

**CHEVALIER JACKSON LECTURE**

**MARTIN A. BIRCHALL, MD**

*London, England*

**THE DREAM OF TISSUE-ENGINEERED  
ORGANS: SCIENCE, HYPE AND  
REALITY**

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**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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Previous Chevalier Jackson Lecturers

1964	D.F.N. Harrison, MD	London, England
1965	Eric Carlens, MD	Stockholm, Sweden
1966	John L. Pool, MD	New York, NY
	Presentations by:	
	Ernest L. Wynder, MD	
	Paul H. Holinger, MD	
	Leslie Bernstein, MD	
	Robert H. Sageman, MD	
1967	Professor Eelco Hizinga, MD	Groningen, Holland
1968	Paul H. Holinger	Chicago, Il
1969	Plinio de Mattos Baretto, MD	Sao Paulo, Brazil
1970	James R. Jude, MD	Miami, Florida
1971	Jo Ono, MD	Tokyo, Japan
1972	G. Gordon McHardy, MD	New Orleans, LA
1973	Hermes C. Grillo, MD	Boston, MA
1974	John R. Gutelius	Kingston, Canada
1975	Donald O. Castell, MD	Philadelphia, PA
1976	Paul Moore, PhD	Gainesville, Fl
1977	Mary Ellen Avery, MD	Boston, MA
1978	George Berci, MD	Los Angeles, CA
1979	Gabriel F. Tucker, Jr., MD	Chicago, IL
1980	Flavio Aprigliano, MD	Sao Paulo, Brazil
1981	Peter Stradling, MD	Somerset, England
1982	Arthur M. Olsen, MD	Rochester, MN
1983	Bruce N. Benjamin, MD	Sydney, Australia
1984	Ronan O'Rahilly, MD	Davis, CA
1985	John A. Tucker, MD	Philadelphia, PA
1986	William G. Anlyan, MD	Durham, NC
1987	Tu Guy-Yi, MD	Beijing, PR of China
1988	Lucius Hill, MD	Seattle, WA
1989	Bernard R. Marsh, MD	Baltimore, MD
1990	David R. Sanderson, MD	Scottsdale, AZ
1991	Michael E. Johns, MD	Baltimore, MD
1992	Whitney Addington, MD	Chicago, IL
1993	Henry J. Heimlich, MD	Cincinnati, OH
1994	John A. Kirchner, MD	Woodbridge, CT
1995	Minoru Hirano, MD	Krume, Japan
1996	Harold C. Pillsbury, III, MD	Chapel Hill, NC
1997	Gerald Healy, MD	Boston, MA
1998	Robin T. Cotton, MD	Cincinnati, OH
1999	Jamie Koufman, MD	Winston-Salem, NC
2000	Stanley Shapshay, MD	Boston, MA
2001	Paul A. Levine, MD	Charlottesville, VA
2002	Steven D. Gray, MD	Salt Lake City, UT
2003	Wolfgang Steiner, MD	Gottingen, Germany

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**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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Previous Chevalier Jackson Lecturers Continued

2004	Jonathan Aviv, MD	New York, NY
2005	John Ward, MD	Chicago, IL
2006	Steven M. Zeitels, MD	Boston, MA
2007	Peak Woo, MD	New York, NY
2008	Reza Shaker, MD	Milwaukee, WI
2009	Jamie Koufman, MD	New York, NY
2010	Clarence T. Sasaki, MD	New Haven, CT
2011	Jeffrey Laitman, PhD	New York, NY
2012	Martin A. Birchall, MD	London, England

**DISCUSSION**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**Thursday, 19 April 2012**

**SESSION VII**

**VOICE**

**Moderator: Thomas Carroll, MD**  
*Boston, MA*

**USE OF LARYNGOSCOPY FOR NEW ONSET  
HOARSENESS: A SURVEY OF THE  
AMERICAN BRONCHESOPHAGEAL  
ASSOCIATION (ABEA) MEMBERSHIP**

**Benjamin C. Paul, MD\***

Nandini Govil, BS\*

Ryan C. Branski, PhD\*

Milan R. Amin, MD

*New York, NY*

**Purpose.** The Clinical Practice Guidelines (CPG) has raised several questions regarding standard practice for patients with hoarseness. Issues related to the value of laryngoscopy and stroboscopy, as well as the appropriate timing of laryngeal imaging remain controversial. We sought to determine the extent to which these guidelines concur with current clinical practice among the membership of the ABEA.

**Methods:** An IRB- and ABEA-approved web-based survey was distributed to the membership of ABEA. The survey was composed of four sections: 1) background and demographic information, 2) information regarding the appropriate length of time that new onset dysphonia may be managed before laryngoscopy given particular co-morbidities, 3) the frequency and risk of office-based laryngoscopy, and 4) the overall value of laryngoscopy and stroboscopy.

**Results:** Seventy-one members of the ABEA completed the survey with a combined 1,468 years of post-residency experience. Approximately 75% of respondents were involved in a fully-academic practice. Across all respondents, 11 patients new voice complaints were seen per week. Overall, 98.6% believe flexible laryngoscopy is very valuable. Regarding co-morbidities that may modify the timing of laryngoscopy for new onset hoarseness, stridor in a neonate and potential foreign body were both conditions necessitating laryngoscopy on the day of presentation (<1 day delay). Regarding patients with new onset dysphonia and no serious underlying condition(s), the mean duration until laryngeal examination was felt necessary was 12.96 days (range of 0 to 30 days).

**Conclusions:** These data suggest that current practice patterns amongst largely academic otolaryngologists are divergent from the CPG.

**VOICE OUTCOME FOLLOWING  
UNILATERAL VOCAL FOLD PARALYSIS**

**VyVy N. Young, MD**

Libby J. Smith, DO

Clark A. Rosen, MD

*Pittsburgh, PA*

To assess voice outcomes in patients with unilateral vocal fold paralysis (UVFP) a review was performed of patients with LEMG-proven UVFP and their VHI-10 scores at presentation and at return of motion or prior to decision regarding definitive treatment (~6 months).

Thirty-four patients met the inclusion criteria. 24% experienced return of VF motion; 76% did not. Average VHI-10 of all patients presenting with UVFP was 25.7/40. Average presenting VHI-10 was 26.4 for patients who recovered motion and 25.5 for those who did not ( $p=0.841$ ). 73.5% of patients underwent temporary VF injection (VFI). For patients who recovered VF motion, average delta-VHI was -30.4 for those who underwent VFI and -6.3 for those who did not ( $p=0.0004$ ). For patients who did not recover motion, the average delta-VHI-10 was -13.45 for those who underwent VFI and +4.5 for those who did not ( $p=0.0005$ ). At the “final” assessment (return of motion or decision regarding permanent treatment), 87.5% of patients with return of motion had normal VHI-10 vs. 26.9% of patients who did not have return of motion ( $p=0.0046$ ).

Return of VF motion is a vital determinant of voice outcome in patients with UVFP. However, even with return of VF motion, 12% of patients still had a significant voice handicap. In contrast, 27% of patients without recovery of motion had a normal VHI-10. This information can be used to counsel patients on the voice outcome (precluding permanent treatment) both with and without recovery of motion. There may be long-term voice benefit from an early temporary VFI.

11:01AM

Thursday, 19 April 2012

**HEMODYNAMIC STABILITY DURING OFFICE-BASED FLEXIBLE ENDOSCOPIC PROCEDURES - SHOULD WE BE MONITORING VITAL SIGNS?**

**Michele P. Morrison, MD\***

*Portsmouth, VA*

Ashli O'Rourke, MD\*

Paul Weinberger, MD

Gregory N. Postma, MD

*Augusta, GA*

Gregory R. Dion, MD\*

*San Antonio, TX*

Robert L. Eller, MD\*

Lakenheath, UK

**Purpose:** There is a preponderance of literature supporting the safety of office-based flexible endoscopic procedures (OBFE); however, until recently there was no data regarding hemodynamic stability during these procedures. A recent study showed changes in patients' hemodynamics during these procedures raising the concern that perhaps patients should be monitored during OBFE. The aim of this study was to determine if physiologically significant alterations in vital signs during OBFE occurs.

**Methods:** Retrospective chart review of 100 patients undergoing OBFE from July 2010 to September 2011. Baseline values and maximal change for systolic blood pressure, diastolic blood pressure, pulse, and oxygen saturation were recorded and compared.

**Results:** One hundred consecutive patients were included in the study. Twenty one patients (21%) had severe hypertension and forty patients (40%) had tachycardia during the procedure. The mean change overall in systolic blood pressure was 28.36, diastolic blood pressure 16.72, heart rate 20.32, and oxygen saturation 1.76%. All of these values were significant with a p-value <0.001.

**Conclusions:** These data concur with the previous report that there is hemodynamic instability during OBFE. While preliminary and based on only 100 patients, our findings suggest that it may be wise to use vital sign monitoring during these procedures for patients with a history of hypertension or coronary artery disease. This will allow for extremes in blood pressure, heart rate, or oxygen saturation to be noticed and addressed acutely.

Views expressed here are those of the authors and don't reflect the official policy or position of the US Government.



DIAGNOSIS AND MANAGEMENT OF “NON-PULMONARY” CHRONIC COUGH

**Jamie Koufman, MD**

*New York, NY*

**Background:** Chronic cough is one of the most common symptoms for which a patient seeks medical attention; presented here are the author’s diagnostic and therapeutic approach and data.

**Materials and Methods:** Retrospective review of 50 patients with chronic cough, mean duration of cough of 13.5  $\hat{A}\pm$  12.5 years. All subjects underwent videostroboscopy, 86% reflux testing, and 60% laryngeal electromyography EMG. Based upon the diagnosis, study patients were treated for laryngopharyngeal reflux (LPR) and/or for neurogenic cough. Medicines in the latter group included: amitriptyline, tramadol, gabapentin, and clonazepam. Cough was graded on a 5-point scale: 0-None, 1-Infrequent, 2-Mild, 3-Moderate, 4-Severe, 5-Extreme/Disabling. At presentation, every subject was severely symptomatic for cough (grade 4 or 5).

**Results:** Of the study subjects, the diagnosis was LPR alone 40% (20/50), neurogenic cough alone 12% (6/50), and both 48% (24/50). Seventy-four percent (37/50) had pH-documented LPR; 60% (30/50) had neuropathic findings on EMG; and 46% had both LPR and vocal fold paresis. The mean number of pH-documented pharyngeal reflux events was (122.5  $\hat{A}\pm$  20.2). Of the 37 abnormal pH studies, 100% had pharyngeal reflux, but only 12 (32%) had abnormal esophageal pH data. Thus, had those subjects undergone traditional single-probe or impedance reflux studies, two-thirds (25/37) would have had false-negative reflux studies.

**Treatment outcomes:** Eighty percent (40/50) of the study group responded to treatment, having mild or no cough at all (grade 0 or 1). Six subjects were unimproved (grade 4 or 5); and at the time of this report, antireflux surgery was recommended for three.

11:15 AM

Thursday, 19 April 2012

SINGLE-OPERATOR FLEXIBLE  
NASOLARYNGOSCOPIC GUIDED  
TRANSTHYROHYOID VOCAL FOLD INJECTIONS

**C. Kwang Sung, MD\***

Gabriel J. Tsao, MD\*

*Stanford, CA*

**Purpose:** A number of laryngeal injection techniques have been described for performing vocal fold medialization or delivery of medications, including peroral and percutaneous approaches. While flexible nasolaryngoscopic guided injections (FNGI) improves visualization and patient tolerance over rigid endoscopy, the technique requires an assistant to manipulate the laryngoscope. The efficacy and patient tolerance of a novel, single-operator technique for FNGI is evaluated.

**Methods:** Patients requiring laryngeal injection for vocal fold medialization, cidofovir or steroids were included in this study. Indications included vocal fold paresis/paralysis, recurrent respiratory papillomatosis and laryngeal granulomas. All procedures were performed awake in the office setting with topical and local anesthesia. Flexible nasolaryngoscopy was performed by the surgeon using the non-dominant hand while performing trans-thyrohyoid injection utilizing a 25-gauge needle with a proximal and distal bend with the dominant hand.

**Results:** 25 patients had a total of 32 single-operator FNGI procedures. 8 unilateral and 9 bilateral vocal fold medializations, 8 bilateral cidofovir injections, and 6 unilateral and 1 bilateral steroid injection were performed. All procedures were completed with adequate visualization and placement of injectate with good patient tolerance.

**Conclusions:** Single-operator FNGI via trans-thyrohyoid approach is a viable and versatile laryngeal injection technique for a variety of indications. It provides the ability to access the anterior, middle and posterior larynx. It eliminates the need for an assistant experienced in nasolaryngoscopy and allows the surgeon to adjust and optimize visualization in a fashion analogous to endoscopic sinus surgery.

**DISCUSSION**

**11:37 AM**

**Thursday, 19 April 2012**

**SENIOR DISCUSSANT:**

**CHARLES N. FORD, MD**

*Madison, WI*

**Introduction of New President**

**PETER KOLTAL, MD**  
*Stanford, CA*

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**11:55 AM**

**Thursday, 19 April 2012**

**ADJOURN**

**LUNCH WITH EXHIBITORS**

**12:15 PM**

**Thursday, 19 April 2012**

**Annual Photograph of the Membership**

**THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION**

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**AMERICAN LARYNGOLOGICAL ASSOCIATION**

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All ABEA, AAFPRS, ALA, ARS, ASPO and TRIO  
registrants and guests are invited.

Scientific Posters will be attended by authors.

*Abstracts of ABEA submissions to the  
Combined Scientific Poster Session*

*appear on pages (88-126) of this program booklet.*



1-033

**PROGRESSION OF WEGENER'S  
GRANULOMATOSIS OVER TIME IN AND  
OUTSIDE OF THE HEAD AND NECK**

Stanford C. Taylor, BS  
Daniel R. Clayburgh, MD, PhD  
James T. Rosenbaum, MD  
Joshua S. Schindler, MD  
*Portland, OR*

**Purpose:** To describe the presentation and natural history of Wegener's granulomatosis (WG) and to compare outcomes of WG patients with systemic disease to those with limited disease confined to the head and neck.

**Methods:** A retrospective review was performed on WG patients (identified by positive ANCA, biopsy, or clinical presentation) seen in the otolaryngology department of an academic medical center between 2005 and 2010. Data were obtained on presentation, manifestation, and surgical treatment. Descriptive statistics and chi-squared analysis were performed ( $p < 0.05$  denoting significance).

**Results:** 24 patients were identified; the cohort was followed for 164 patient-years. Sinusitis and subglottic stenosis (SGS) were the most common presenting complaints, seen in 64% and 36%, respectively. Over time, disease involvement spread to additional sites in more than half the cohort ( $n=13$ ), with the two most common being the middle ear ( $n=9$ ) and subglottic airway ( $n=7$ ). Two patients who originally presented with limited WG progressed to systemic disease involvement and a total of 11 patients had systemic WG at the date of last follow-up. Patients with systemic disease had a similar frequency of surgical interventions to those with limited involvement (0.59 vs. 0.55 interventions/patient-year,  $p=0.80$ ). Patients with SGS were diagnosed younger than those without SGS (34.4 vs. 49.8 years,  $p=0.02$ ).

**Conclusion:** Wegener's granulomatosis is a multi-faceted disease with a variety of manifestations, often demonstrating a natural history characterized by progressive head and neck involvement. Patients with systemic and limited forms of the disease present with similar upper aerodigestive tract manifestations and require comparable clinical utilization.

1-034

**AN INTERESTING CASE: AIRWAY FOREIGN  
BODY WITH MAGNETIC PROPERTIES**

Jeffrey Cheng, MD  
Ian Jacobs, MD  
*Philadelphia, PA*

The patient was a 9 year old female who presented after aspirating a Groovyball. They are advertised for patients aged 15 and older and are magnetic balls made from rare-earth metals, which can be molded together into different shapes and patterns. The patient was otherwise in no respiratory distress. A chest radiograph demonstrated a metallic foreign body in a right lung bronchus, and the patient was brought to the operating room for a rigid bronchoscopy.

Prior to undertaking the bronchoscopy, forceps for extraction of the Groovyball were tested, and it was found that the magnetic properties allowed them to be attracted to the rigid, ventilating bronchoscope body. The bronchoscopy revealed a metallic ball foreign body visualized in the right lower lobe bronchus, but given the particular position and degree of impaction in the bronchus, it was felt that the available optical forceps would not be able to be opened around the foreign body. A non-optical, Pilling bead remover, which deployed from a closed position, was used with naked eye visualization to mobilize the Groovyball and move it proximally towards the ventilating bronchoscope. Once mobilized and close enough, the Groovyball was magnetized into the lumen of the bronchoscope and able to be removed. The patient was extubated immediately postoperatively and did well and was able to be discharged home from the postanesthesia care unit.

1-035

**THE USE OF THE PERIPHERAL CUTTING  
BALLOON IN THE MANAGEMENT OF  
TRACHEAL STENOSIS**

Bianca Siegel, MD  
John P. Bent MD  
*Bronx, NY*

**Purpose:** We review the currently available literature on the use of the peripheral cutting balloon in the management of the airway. We then describe a case in which we used the peripheral cutting balloon and discuss our experiences with the balloon. We show that the cutting balloon is safe and effective, and suggest some pros and cons of the cutting balloon compared to standard balloon dilation.

**Design/Method:** Literature review/ case report

**Summary:** The cutting balloon is a relatively new device being used in coronary angiography. It is an endovascular balloon which has 4 longitudinal blades on it, allowing it to score the lesion prior to dilation. It was designed to effectively dilate with less pressure than a conventional balloon. It has been reported to effectively treat pediatric tracheal, bronchial and subglottic stenosis effectively, although the literature is very scant. We describe a case in which it was used to safely and effectively dilate an adult's airway from 1 mm to 5 mm diameter. A significant advantage of the cutting balloon compared to a conventional balloon is that the blades anchor the balloon into the tissue, preventing the balloon from sliding out of the stenosis during dilations, as commonly occurs with conventional balloons. Disadvantages include possible damage to the vocal cords if not used carefully, and possibly increased bleeding.

**Conclusions:** The cutting balloon can be used safely and effectively in the airway, and is a good option to add to ones armamentarium of options available in the management of tracheal stenosis.

1-036

**CASE REPORT OF A 30 YEAR OLD MAN  
WITH A CONGENITAL LARYNGEAL WEB**

Amanda Hu, MD  
Kevin Fung, MD  
*Ontario, Canada*

**Objective:** To present a rare and interesting case of a 30 year old man with a congenital laryngeal web

**Methods:** We reviewed the chart for this case and conducted a literature review in OVID medline (1966 to 2010). This study was deemed exempt by our institutional review board.

**Results:** A 30 year old man presented with hoarseness since birth. He had dysmorphic facial features, fissured tongue, irregular articulation, orthopaedic abnormalities of the hands and elbows, and mental retardation. It was unclear why the patient did not seek medical attention earlier. He was born in the Bahamas and had a weak cry since birth. He denied any airway symptoms. Videostroboscopy showed a glottis web obstructing up to  $\frac{3}{4}$  of his airway. He was treated with CO2 laser lysis of this glottis web and Kenalog injection. Postoperatively, his voice symptoms resolved completely. Cytogenetics testing was negative for 22q11 microdeletion syndrome.

**Conclusion:** This 30 year old man had a congenital laryngeal web. A review of the literature showed that it is rare for congenital laryngeal webs to present so late in life. We present this interesting case to highlight the importance of keeping this diagnosis in the differential for hoarseness in adults.

1-037

**ALIGNMENT AND THICKNESS OF THE  
VOCAL FOLD AFTER IMMEDIATE  
RECONSTRUCTION OF THE RECURRENT  
LARYNGEAL NERVE**

Eiji Yumoto, MD, PhD  
Yoshihiko Kumai, MD, PhD  
Kohei Nishimoto, MD  
Yutaka Toya, M.D  
Tetsuji Sanuki, MD, PhD  
*Kumamoto, Japan*

**Purpose:** Immediate reconstruction of the recurrent laryngeal nerve (RLN) following resection of the nerve together with invading cancer provides an excellent postoperative vocal function. This paper aims at determining perioperative changes in alignment and thickness of the vocal fold (VF) after immediate reconstruction of the RLN.

**Patients and Methods:** The RLN was reconstructed immediately after resection of malignancies on 10 patients who had had unilateral VF paresis or paralysis. Four of them underwent three-dimensional computed tomography (3DCT) during inhalation and phonation pre- and postoperatively and served as subjects. Three with thyroid cancer received nerve implantation using a piece of great auricular nerve and the other with cervical metastasis of breast cancer underwent nerve transfer to the ansa cervicalis nerve.

**Results:** Periods between surgery and 3DCT ranged from 13 to 24 months with a mean of 19.5. Normal vocal function was obtained in the four patients over time. Preoperatively, all had posterior glottal gap. The affected VF in two patients was thinner than its mate during phonation. In one patient, the affected VF remained to be thin during both maneuvers. The affected VF in the other was thinner during phonation than during inhalation. Postoperatively, the posterior glottis approximated at the midline and the thickness of the affected VF increased being symmetrical with the healthy side during phonation in all patients.

**Conclusions:** Immediate reconstruction of the RLN results in median location and thickening of the affected VF during phonation and, therefore, provides excellent vocal function although its movement is not recovered.

1-038

THE PHYSIOLOGIC IMPACT OF TRANSNASAL  
FLEXIBLE ENDOSCOPY

Julina Ongkasuwan, MD

*Houston, TX*

Katherine C. Yung, MD

Mark S. Courey, MD

*San Francisco, CA*

**Purpose:** Diagnostic transnasal flexible endoscopy (TNFE) is a commonly used office procedure in otolaryngology. Currently there is a paucity of data on the impact of TNFE on physiologic parameters. This is relevant with the advent of office based endoscopic procedures. The goal of this study is to measure the impact of topical decongestion, anesthesia and diagnostic TNFE on vital signs: systolic and diastolic blood pressure (SBP and DBP), heart rate (HR) and oxygenation (O<sub>2</sub> sat).

**Design and Methods:** Prospective case control study- the patient is his/her control. Vital signs were obtained at baseline, after the application of Neo-Synephrine, after the application of lidocaine, five minutes later, with the scope in the nasopharynx, hypopharynx, and upon completion of the procedure.

**Results:** Compared to the baseline data, there was a statistically significant increase in HR after the procedure (mean change 4.06 +/- 10.15 bpm, range -14 to 42 bpm, p=0.01). There was also a change in O<sub>2</sub> sat (mean change 0.42 +/- 1.36%, range -3 to 3%, p=0.03) after the application of lidocaine. When comparing each data point to the preceding point there was a statistically significant change in SBP with the scope in the nasopharynx (mean change 5.34 +/- 10.65 mmHg, range -22 to 28 mmHg, p=0.001) and in HR with the scope in the hypopharynx (mean change 3.76 +/- 6.41 bpm, range -9 to 19 bpm, p=0.0004).

**Conclusion:** Diagnostic TNFE and topical lidocaine can have an impact on physiologic parameters; however these changes are unlikely to be clinically significant.

1-039

DEVICE FAILURE AS A POTENTIAL LIFE-THREATENING  
COMPLICATION OF BALLOON DILATION FOR  
SUBGLOTTIC STENOSIS: A CASE REPORT

Jihad Achkar, MD  
Philip Song, MD  
Jayme Dowdal, MD  
*Boston, MA*

We report the case of a 39 year old woman with Idiopathic Subglottic Stenosis (ISS) who had entrapment of an inflated balloon in her subglottis due to a broken catheter while undergoing Balloon Dilation of the stenotic area. There is usually a tendency for the balloon to move away from the constricted area during inflation, and a certain degree of pulling force on the catheter is usually required to ensure continued proper placement. We report a case where the catheter stretched and ultimately tore during inflation, resulting in narrowing of the distal outer lumen (Inflation/Deflation port) within the shaft of the device leading to inability to completely deflate the balloon. The detached partially inflated balloon was then trapped within the subglottic area. Multiple attempts to remove the firmly fixed balloon in the subglottis were finally successful after 2 large forceps were used to grasp, manually deflate and pull out the balloon. To our knowledge, this is the first report describing a dislodged inflated balloon in the subglottis as a complication of dilation for ISS. Awareness about this possibility as well as preparedness with the proper instruments is vital for prevention of a real emergency during an otherwise low risk procedure.

1-040

**MANAGEMENT OF AN AIRWAY FOREIGN  
BODY USING UNSEDATED  
TRACHEOBRONCHOSCOPY IN A  
MORBIDLY OBESE PATIENT**

Emily N. Hrisomalos, BA  
Stacey L. Halum, MD  
*Indianapolis, IN*

**Purpose of the Study:** To describe the use of unsedated tracheobronchoscopy in the management of an unexpected airway foreign body (AFB) in a morbidly obese tracheostomy tube-dependent patient.

**Design and Method of Study and Analysis:** Case presentation.

**Summary of Results:** A 33 year old morbidly obese female presented for routine tracheostomy tube change in clinic and was unexpectedly found on tracheobronchoscopy to have a thin wooden object within the distal trachea. The object was believed to be the distal end of a Q-tip, appearing to be split down the middle leaving two splintered wooden ends above the carina and protruding into the left mainstem bronchus. The patient had not experienced symptoms of airway obstruction beyond her baseline and denied inserting anything into her airway. After topical anesthesia application, unsedated tracheobronchoscopy with a biopsy forceps was used to remove a single splintered Q-tip, only to discover a second Q-tip was also present. The second Q-tip was removed atraumatically without complication. Upon review of the patient's medical records, the patient had a remote history of undergoing sedated tracheobronchoscopy by a pulmonologist two years ago for bronchial Q-tip removal. She admitted no recollection.

**Conclusions:** The current case demonstrates use of unsedated tracheobronchoscopy for airway foreign body management in a morbidly obese tracheostomy tube-dependent population. In repeat AFB offenders, regular office screening and management is a good option to avoid sedation and general anesthesia.



1-041

TEMPOROPARIETAL FASCIAL FREE FLAP REPAIR  
OF A RECURRENT ACQUIRED NONMALIGNANT  
CRICOESOPHAGEAL FISTULA

William G. Young, MD  
Tamer A. Ghanem, MD, PhD  
Glendon M. Gardner, MD  
*Detroit, MI*

**Purpose:** To describe the typical presentation and unique treatment option for patients presenting with a recurrent cricoesophageal fistula.

**Study Design:** case report.

**Methods:** The case report was generated through chart review looking at physical findings found at presentation and intraoperative findings. A literature search was completed, investigating other similar surgical management options.

**Results:** The patient was a 63 year old female who developed bilateral vocal fold paresis due to thyroidectomy requiring a tracheostomy following prolonged intubation. After decannulation 3 months later, she developed increasing respiratory difficulty and was found to have subglottic tracheal stenosis with focal malacia which was managed with a Dumon-Y stent. Granulation tissue formation at the proximal stent required intervention several times. About 29 months after stent placement, she began to experience coughing with food intake and was found to have a cricoesophageal fistula on a modified barium swallow study. After failing 2 repairs, the fistula was repaired again with additional coverage via a temporoparietal facial free flap which was placed between the repaired anterior esophageal wall and the posterior aspect of the cricoid. Two months post operatively, she has shown no further signs of recurrence.

**Conclusion:** Cricoesophageal / tracheoesophageal fistulas are known complications from airway interventions such as intubation, tracheostomy, airway stent placement. Surgical management of the recurrent cricoesophageal fistula may require vascularized tissue coverage but is limited by the available space. In this study, we describe a successful unique repair of a recurrent cricoesophageal fistula with coverage via a TPF.

1-042

**CLINICAL EVALUATION OF SAFETY AND  
EFFICACY OF ENDOSCOPIC-ASSISTED  
ARYTENOID ADDUCTION SURGERY**

Takaaki Murata, MD, PhD  
Yoshihito Yasuoka, MD  
Tetsuaki Shimada, MD  
Masato Shino, MD, PhD  
Hideki Iida, MD  
Kazuaki Chikamatsu, MD, PhD  
*Gunma, Japan*

**Objectives:** Arytenoid adduction (AA) is the most effective procedure for improving voice function in patients affected by unilateral vocal fold paralysis (UVFP), but it is often associated with severe complications following airway obstruction. We have previously reported the principle of operative procedure for a novel and less invasive endoscopic-assisted AA surgery (EAAS). In this study, we evaluated safety and efficacy of EAAS.

**Study Design:** Retrospective review of case series.

**Method:** The charts of twelve patients who underwent EAAS alone or combined with type I thyroplasty or lipoinjection laryngoplasty were retrospectively reviewed.

**Results:** Most patients achieved the maximum phonation time of over 10 seconds (4.1 vs. 13.8 sec,  $P=.0069$ ) and the mean air flow rate of less than 200 ml/second (546.3 vs. 156.9 ml/s,  $P=.0061$ ). Based on the preoperative data for shimmer, jitter and harmonics-to-noise ratio (HNR), the improvement in these acoustic analysis parameters after surgery was estimated (shimmer: 17.76 vs. 4.89%,  $P=.0173$ , jitter: 10.39 vs. 2.19%,  $P=.0171$ , HNR: 0.41 vs. 0.14,  $P=.0179$ ). Though one patient had transient arytenoid hematoma, no major postoperative complications in early phases such as airway obstruction have occurred. Only one patient who underwent EAAS combined with type I thyroplasty required revision surgery as a consequence of relapsing glottal gap by break of nylon thread. Revision surgery was successfully performed and voice outcomes were significantly improved after surgery.

**Conclusions:** Our results reveal that EAAS is a safe and effective procedure for patients with UVFP.

1-043

LONG TERM EFFECT OF FAT INJECTION  
LARYNGOPLASTY ACCORDING TO THE FAT  
VOLUME IN PATIENTS WITH UNILATERAL  
VOCAL FOLD PARALYSIS

Hirohito Umeno MD  
Shun-ichi Chitose MD  
Akiteru Maeda MD  
Takeharu Ono MD  
Ryota Mihashi MD  
Yoshihisa Ueda MD  
Kiminori Sato MD  
Tadashi Nakashima MD  
*Kurume, Japan*

**Purpose:** To evaluate the improvement of vocal function and a glottal form according to injected fat volume in autologous fat injection laryngoplasty.

**Design and Method:** Seventy-three patients received fat injection laryngoplasty (FIL). They were divided into two groups according to injected fat volume. One group was less than 3ml of injected fat (low volume: average; 2.0ml) and the other was more than 3ml (high volume: average; 4.3ml). The voice functions before and after FIL were examined by an aerodynamic (MPT, MFR), pitch and intensity (F0 range, SPL range) and acoustic analysis (PPQ, APQ NNEa). The glottal form before and after FIL were determined by measuring the ratio of glottal bowing (bowing ratio) and the ratio of length of bilateral vocal process (width ratio) at phonation. The postoperative parameters were evaluated 4 years (median) after the FIL. The differences between pre- and post-operative parameters were examined by the paired t-test for each group separately. For each variable, a comparison of the effects of surgery was conducted using an analysis of covariance (ANCOVA) model with the change between the pre- and postoperative values as a dependent variable and the preoperative value as a covariate.

**Results:** In both groups, all parameters after surgery significantly improved in comparison to before. MPT, APQ and NNEa after high volume group improved more significantly in comparison to that after low volume group.

**Conclusions:** More than 3ml autologous fat was encouraged for reliable improving the vocal function and glottal shape in patients with vocal fold paralysis.

1-044

A NOVEL METHOD FOR LARYNGOTRACHEAL  
RECONSTRUCTION: COMBINING SINGLE- AND  
DOUBLE-STAGE TECHNIQUES

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Christopher J. Hartnick, MD  
*Boston, MA*  
Stephen Mauro, MD  
*San Antonio, TX*

**Purpose of the Study:** Traditional open techniques for laryngotracheal reconstruction are either single- or double-stage procedures. Some patients may benefit from the presence of a long, single-tube stent, such as an endotracheal tube, but in whom the predicted need for a two-stage procedure and a persistent tracheotomy is high. We describe a novel technique for airway reconstruction that combines methods of both single- and double-stage procedures.

**Design and Method of Study and Analysis:** Retrospective review of 4 patients. All patients underwent open laryngotracheal reconstruction by a single surgeon. Post-operatively, the reconstructed airway was stented with nasotracheal intubation. A small stent, fashioned from an endotracheal tube, was placed in the tracheostoma to keep the stoma patent. Subsequently, patients underwent extubation and replacement of the tracheostomy tube.

**Summary of Results:** The study group included one patient with grade 4 subglottic stenosis, two patients with grade 3 subglottic stenosis, and one with a posterior glottic scar. All were tracheostomy tube dependent. Serial bronchoscopy was used to follow patients for a minimum of 9 months post-operatively. Two patients have since been decannulated and the remaining two are awaiting decannulation.

**Conclusions:** This hybrid laryngotracheal reconstruction is a novel technique that combines the advantages of both the single- and double-stage procedures. It allows the use of a short-term stent in the reconstructed airway and keeps the tracheostoma patent to secure the airway post-operatively. It is useful in patients with high grade stenosis, multilevel stenosis, or those with co-morbidities who may not yet be candidates for decannulation.

1-045

**BACKYARD HAZARD: A CASE SERIES OF  
INGESTED GRILL BRUSH BRISTLES AND A  
NOVEL APPROACH TO EXTRACTION**

Caitlin McMullen, MD

*Bronx, NY*

Douglas Frank, MD

Lee P. Smith, MD

*New Hyde Park, NY*

**Purpose:** To report a small case series of an unusual ingested foreign body. We also present a new method for removal of tongue base foreign bodies.

**Design and Methods:** Three patients were identified with cervical wire bristle foreign bodies between 2009 and 2011 at our academic tertiary medical center. Their medical records were reviewed and are described in this report.

**Results:** Each patient presented to our medical center with progressive pain after ingestion of barbecued food. For two patients the metallic bristle foreign body was imbedded within the lingual tonsils. In these two cases, partial radiofrequency plasma ablation (Coblation) assisted lingual tonsillectomy was performed to identify the foreign body. In one case, the foreign body presented as a complex deep space neck abscess and an open trans-cervical approach was required.

**Conclusion:** While oropharyngeal and esophageal foreign bodies are common, there is only one other case report describing this particular foreign body. The presentation of imbedded wire grill brush bristles can be insidious. Persistent pain and foreign body sensation should be taken seriously in patients with a history of barbecue food ingestion. Intraoperatively, wire bristles can be difficult to localize and extract. Radiofrequency plasma assisted lingual tonsillectomy may be helpful for identifying and removing foreign bodies that are imbedded in the tongue base.

1-046

**TRANSEPIHELIAL RESISTANCE IN THE  
RABBIT VOCAL FOLD**

Mark Van Deusen, MD

Tsuyoshi Kojima, MD

Jerod Denton, PhD

Hongmei Wu, MD

Bernard Rousseau, PhD

*Nashville, TN*

Mahalakshmi Sivasankar, PhD

Elizabeth Erickson-Levendoski, MS

*West Lafayette, IN*

**Purpose:** The vocal folds are covered by a stratified squamous epithelium. The epithelium forms a barrier shielding the underlying connective tissue from potential chemical or mechanical damage. Transepithelial resistance (TER) has been used as an indicator of barrier function in the epithelium of ovine and porcine vocal folds. However, to date, TER has yet to be characterized in the rabbit vocal fold. The current study describes TER in the native rabbit vocal fold.

**Design and Methods:** A total of ten New Zealand white breeder rabbits weighing 3 kg to 5 kg were used. To measure TER, freshly excised rabbit larynges were hemisected along the posterior aspect and the laryngeal lumen was exposed. The vocal fold epithelium and superficial layer of the lamina propria was dissected from the underlying ligament. The excised vocal fold was mounted on a commercially-available Lucite chamber and placed in a pre-calibrated Ussing system with associated voltage clamp. The tissue was bathed in warm, oxygenated (95% O<sub>2</sub>, 5% CO<sub>2</sub>) Hanks Balanced Salt Solution. Voltage and current electrodes were placed on the luminal and basal sides of the mounted vocal fold to monitor the potential difference (PD) and short-circuit current (ISC). TER was subsequently derived using Ohm's law (PD/ISC).

**Results:** The average calculated TER for native rabbit vocal fold was 50.96 ohm/cm<sup>2</sup> with a standard deviation of 13.12 ohm/cm<sup>2</sup>.

**Conclusion:** This is the first study to report TER measurements in the native rabbit vocal fold. Future experiments will be planned to investigate changes in TER after various types of damage.

1-047

TRAUMATIC GUNSHOT WOUND TO THE  
PHARYNX WITH SUBSEQUENT ASPIRATION - A  
CASE REPORT AND REVIEW

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*\*Senior Author*

Chris Kieliszak, BS

*Old Westbury, NY*

Kent Stevens, MD

*Baltimore, MD*

**Purpose:** Penetrating trauma to the neck and foreign body aspiration are two injuries that infrequently occur in adults. Reports of the two presenting simultaneously have rarely been described in the literature, and little information is available concerning the correct approach for treatment.

**Design:** Case presentation with brief literature review.

**Summary of Results:** The authors present the unusual case of a gunshot wound to the pharynx followed by aspiration of the bullet in an adult patient. Few reports exist within the literature concerning the incidence of traumatic penetrating injury to the neck followed by aspiration. A review of similar injuries is discussed along with a description of the algorithm used to evaluate the penetrating injury followed by foreign body extraction. A brief discussion of removal techniques is offered.

**Conclusion:** We describe the successful treatment of an adult patient after aspiration of a bullet following a gunshot wound to the anterior neck. A careful and systematic approach should be utilized given the host of complications that can result from mismanagement of either the penetrating injury to the neck or the aspiration as the risk of morbidity and mortality is significant.

1-048

A NEW STABILIZATION GRIPPING INSTRUMENT  
FOR MICRO LARYNGEAL SURGERY

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Shiro Arai, PhD  
Takahiro Fukuhara, MD  
Naritomo Miyake, MD  
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**Purpose of the Study:** Micro laryngeal surgery is a kind of minor surgery that involves the use of endoscope, which is inserted in the larynx area through the mouth. Laryngeal instruments compose long shafts and a handle consisting of a fixed handle part and of a handle part that can pivot in relation to the fixed handle part. The involuntary movements at the distal end will be tilted broader by shaking the proximal end of the handle. We developed the stabilization gripping tool which proved to be very efficient to reduce shaking during micro laryngeal procedures.

**Design and Method of Study and Analysis:** The shape of the grip is similar to the pistol grip. The finger loops of the laryngeal microsurgery instrument are securely attached to the stabilization grip. To compare the amplitude of involuntary movements at the tip of the laryngeal microsurgery instruments with and without the stabilization grip, we use the motion analyze system. The motion analysis processing can find and track the points in the image where the distal end of the shaft is moving over time to determine the magnitude and direction of the motion of every point in the image.

**Summary of Results:** The displacement to the target was higher in the maneuver to open and close the laryngeal instruments without the stabilization grip tools.

**Conclusions:** Minimally displacement by the surgeon is important during the procedure, our stabilization grip may help steadier movement for micro laryngeal surgery.



1-049

OUTCOMES OF ALLERGY IMMUNOTHERAPY ON  
VOICE AND LARYNGEAL SYMPTOMS IN PATIENTS  
WITH ALLERGIC RHINITIS AND DYSPHONIA

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**Purpose:** The purpose of this study is to determine the effect of intradermal allergy immunotherapy on voice-related symptoms, laryngeal symptoms, and rhinoconjunctivitis symptoms in patients with allergic rhinitis and dysphonia.

**Methods:** Prospective cohort study. Forty-four patients with allergic rhinitis and dysphonia at baseline were evaluated using the Voice-Related Quality of Life survey (VRQOL), mini-Rhinoconjunctivitis Quality of Life Questionnaire (mini-RQLQ), and the Reflux Symptom Index (RSI). They underwent standard intradermal immunotherapy based on their individual sensitivities and were re-evaluated at 6 months. Paired t-tests were performed.

**Results:** Twenty-six patients with allergic rhinitis and dysphonia completed the 6-month follow-up. The mini-RQLQ score showed improvement from 3.0 to 2.4 ( $p=0.006$ ) and the RSI improved from 18.5 to 13.7 ( $p=0.003$ ). The VRQOL did not improve at 6 months, going from 84.7 to 86.0 ( $p=0.4$ ). Greater changes in mini-RQLQ were associated with greater effect on RSI (Spearman correlation -0.5,  $p=0.02$ ). Results were similar if the patients lost to follow-up were considered "unchanged" from baseline.

**Conclusion:** There does appear to be an improvement in rhinoconjunctivitis and laryngeal symptoms based on the mini-RQLQ and RSI. Greater improvement in the mini-RQLQ appears to be linked to greater improvement in RSI. This further supports the link between nasal and laryngeal symptoms. Perhaps secondary to poor compliance and patients lost to follow-up, no difference was seen in the VRQOL after 6 months of allergy immunotherapy.

1-050

ENDOSCOPIC MANAGEMENT OF A DYNAMIC  
AERODIGESTIVE FOREIGN BODY

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**Purpose:** To examine the challenges of endoscopically removing an airway foreign body in constant motion.

**Summary:** An eleven month old girl was witnessed placing a white bead in her mouth. On examination, she had no evidence of respiratory distress but had persistent dysphonia as noted by her parents. Radiographic imaging was also unrevealing. She was taken urgently to the operating room where mask anesthesia was induced and she continued to respire on her own. Direct laryngoscopy was performed and a bead was noted in the subglottis. Intermittently, with the patient's respirations, the position of the bead would change, coming up into the subglottis just below the vocal cords and then traveling more distally into the trachea. This constant motion made grasping the object difficult. The bead was removed from the trachea with use of a balloon angioplasty catheter inflated distal to the object and retracted towards the glottis. The force of the patient's cough then ejected the bead into the nasopharynx. Rigid bronchoscopy confirmed that there were no additional airway foreign bodies and an endotracheal tube was placed and secured. A laryngeal mirror and adenoid forceps were then used to remove the bead from the nasopharynx.

**Conclusions:** Endoscopists should always be prepared to handle any change in position of a foreign body within the aerodigestive system. Also, successful removal of aerodigestive foreign bodies requires cooperation and coordination between both the endoscopy team and the anesthesia team.

1-051

**ADULT CRICOTRACHEAL RESECTION:  
GUIDELINES FOR POST-OPERATIVE  
AIRWAY MANAGEMENT**

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**Purpose:** Cricotracheal resection (CTR) has inherent postoperative risk of airway compromise, though its goal is to reconstruct the stenotic airway. This paper describes the practicalities of post-operative management of the airway after CTR and outcomes associated with an individualized method of airway management during CTR.

**Methods:** Retrospective chart review

**Summary of Results:** 52 adult patients who underwent CTR over a twelve-year period were identified. Those with stenosis near the undersurface of the vocal folds had a tracheotomy placed below the suture line, while the rest were managed without a tracheotomy. There were 9 patients without a post-operative tracheotomy; 5 were extubated in the operating room. Average hospital length of stay (LOS) in this group was 7.7 days. 11% required a post-operative bronchoscopy for debridement of granulation tissue. None of these patients subsequently required a tracheotomy.

Of the 43 patients with a post-operative tracheotomy, average hospital LOS was 8.9 days. 67% were decannulated before hospital discharge. 4 patients had a laryngeal stent placed. All patients were eventually decannulated. 18% required bronchoscopy in the first two months after CTR for debridement of granulation tissue.

**Conclusions:** Airway management after CTR should be individualized. Most patients do not require subsequent procedures and heal well after CTR. The single-stage CTR is used for those with stenosis further below the vocal folds. While the airway after this procedure has historically been managed with stenting, recent outcomes show selected patients do well without placement of a laryngeal stent or a surgical airway.

1-052

**FLEXIBLE ENDOSCOPIC ZENKER'S  
DIVERTICULOTOMY AND  
CRICOPHARYNGEAL MYOTOMY**

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**Purpose:** To describe flexible endoscopic management of Zenker's diverticulum in a patient who was unable to tolerate rigid endoscopy.

**Design and Methods of Study and Analysis:** Case report with pre- and post-operative imaging, and intraoperative photos. The technique is thoroughly described. A literature search was completed, investigating other similar surgical management options.

**Summary of Results:** The patient was an 83 year old female who had a history of longstanding dysphagia and delayed regurgitation of undigested food. Modified barium swallow revealed a Zenker's diverticulum and multiple cervical osteophytes. The range of motion of her neck was very limited. The patient failed rigid endoscopic Zenker's diverticulotomy and cricopharyngeal myotomy 34 months prior, due to the inability to expose the common wall of the Zenker's diverticulum with the rigid diverticuloscope. She elected not to undergo an open approach. She underwent flexible endoscopic Zenker's diverticulotomy and cricopharyngeal myotomy due to progressive worsening of the dysphagia using a modified flexible overtube, flexible gastroscope and wire electrocautery. She was admitted post-operatively for observation and chest radiographs did not demonstrate pneumomediastinum and gastrografin swallow study was negative for an esophageal leak. Her symptoms were resolved postoperatively.

**Conclusions:** Management of Zenker's diverticulum can be completed through open or endoscopic methods. Most endoscopic methods described use rigid endoscopy, but patient selection is limited by neck extension and transoral exposure. In this study, we describe a successful flexible endoscopic method of Zenker's diverticulotomy and cricopharyngeal myotomy in a patient with limited cervical range of motion.

WITHDRAWN

1-054

**ENDOSCOPIC REMOVAL OF ESOPHAGEAL  
FOREIGN BODY AND DRAINAGE OF  
THYROID ABSCESS**

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**Objective:** To discuss a case of an initially missed upper aerodigestive tract foreign body that was successfully managed endoscopically.

**Study Design:** Case Report.

**Summary of Results:** This is a case of a 58 year old male who presented to the emergency department at our institution with foreign body sensation in the throat after eating fish the night prior. Although lateral soft tissue films of the neck demonstrated a linear foreign body, this was missed and the patient was discharged home. One week later, he re-presented with persistent throat pain. Otolaryngology was consulted to evaluate the patient. A computed tomography scan of the neck demonstrated erosion of the foreign body through the esophageal wall and a rim enhancing collection in the right thyroid lobe. The patient was admitted and broad spectrum antibiotics were started. Using the direct laryngoscope and endoscopic instruments the abscess was drained and a 2.0 centimeter sharp fishbone was successfully removed from a perforation at the esophageal inlet. A nasogastric tube was placed and the patient was kept NPO for 10 days postoperatively while his perforation healed. He had improvement in his symptoms and was stable in follow up.

**Conclusions:** Foreign bodies of the aerodigestive tract can have significant consequences and migrate to atypical locations if missed on initial presentation. However, endoscopic removal still remains a viable option for removal and can avoid the increased morbidity of an open approach.

1-055

**COMPOSITE DIFFUSE LARGE B-CELL AND  
PERIPHERAL T-CELL LYMPHOMA  
PRESENTING AS AN ESOPHAGEAL  
PERFORATION: A CASE REPORT**

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**Purpose:** We report a case of composite lymphoma presenting as an esophageal perforation in a patient with a remote history of Hodgkin lymphoma. **Methods:** We discuss the pertinent clinical, radiographic and histological data of the case and review the literature on composite lymphomas of the upper aerodigestive tract.

**Summary:** The patient, a healthy 42-year old male, was treated with radiation therapy for Hodgkin disease 22 years prior to presentation at our institution. He was transferred from an outside hospital for dysphagia, respiratory distress and radiographic evidence of a cervical esophageal perforation. Biopsies were performed at various intervals during laryngoscopy, neck exploration and retrograde esophagoscopy, revealing only inflammatory and necrotic tissue. Due to persistence of symptoms and progressive disruption of the laryngeal skeleton, the decision was made to perform laryngopharyngectomy. Multiple defects in the pharynx, larynx and proximal esophagus were discovered. Immunohistochemistry demonstrated sheets of large B-cells and a background of T-cells with scattered positivity for Epstein Barr Virus, suggesting a T-cell rich B-cell lymphoma. Molecular studies testing for immunoglobulin and T-cell receptor rearrangements were ultimately required to secure the final pathologic diagnosis of composite diffuse large B-cell lymphoma and peripheral T-cell lymphoma.

**Conclusions:** A high index of suspicion for malignancy should be maintained when wounds fail to respond to therapy. Composite lymphoma of the aerodigestive tract is uncommon, particularly when its components are of both B-cell and T-cell origin. To our knowledge, this is the only report of a composite B-cell and T-cell lymphoma presenting as an esophageal perforation.

1-056

**OROPHARYNGEAL VARIANT OF SPASMODIC  
DYSPHONIA: REPORT OF TWO CASES**

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**Purpose:** To discuss a previously undescribed focal oropharyngeal dystonia specific to voice-related tasks

**Design:** Retrospective chart review of two patients with oropharyngeal variant of spasmodic dysphonia (OVSD)

**Summary of Results:** Both patients were initially misdiagnosed with adductor spasmodic dysphonia and failed standard treatment with botulinum toxin. A novel treatment was designed, directing botulinum toxin (Botox) injections into the muscles involved in spasmodic valving at the oropharyngeal level. Both patients showed significant improvement in VHI-10 values post-injection and have experienced minimal dysphagia. These patients have maintained favorable results with repeat injections at 6-12 week intervals.

**Conclusions:** OVSD is a previously undescribed entity. A novel method of Botox injections into the involved muscles results in improvement in voice without significant dysphagia.



1-057

**FACTORS ASSOCIATED WITH POST-TRACHEOTOMY DYSPHAGIA**

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**Purpose:** The aim of this study is to identify factors associated with increased incidence of post-tracheotomy dysphagia; to our knowledge, there is limited literature on this subject to date.

**Design:** We reviewed 71 cases of patients who underwent tracheotomy at our institution over an 18-month period. We recorded information including demographics, indications for tracheotomy, post-procedure complications, comorbidities, presence of pre-existing dysphagia, and results of post-tracheotomy swallowing evaluation including blue dye studies. We determined statistical significance using Fisher's exact test for categorical variables, and Student's t-test for continuous variables.

**Summary of Results:** Significant associations ( $p < 0.05$ ) were observed between post-tracheotomy dysphagia and: Patient agitation, supraglottic disease, vocal fold motion abnormalities, and patient age. We did not observe any significant associations between post-tracheotomy dysphagia and: Glottic dysfunction, body mass index (BMI), duration of pre-tracheotomy intubation, or endotracheal tube size.

**Conclusions:** Various factors appear to influence the incidence of post-tracheotomy dysphagia; prominent among them are neurologic and laryngeal dysfunction. Identification of these factors will assist with pre-operative counseling and appropriate post-procedure intervention. There are limitations to this study due to its retrospective nature and our results have influenced the design of a prospective study we are currently conducting.

1-058

CANDIDAL BIOFILM ANALYSIS OF  
TRACHEOESOPHAGEAL PUNCTURE PROSTHESIS

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**Objective:** A polymicrobial biofilm has been implicated in nonfunctioning tracheoesophageal puncture prosthesis (TEPs). The purpose was to evaluate and measure Candidal biofilms and colony forming units (CFUs) on functioning and nonfunctioning TEPs.

**Methods:** TEPs were prospectively collected and characterized as nonfunctioning (leaking) or functioning. Through a previously described sonication technique, planktonic species were removed and the biofilms were matured for 72 hours on Chromagar plates specific for Candidal growth. Candidal CFU's were then measured and analyzed.

**Discussion:** A total of 16 TEP specimens were during this study. 11 TEPs were malfunctioning and 5 were for changed routine replacement. There was a trend toward higher CFUs on the mature biofilms from the TEPs that were malfunctioning compared to the properly functioning TEPs. The mean Candidal CFUs/mL was  $1.1 \times 10^5$  versus  $4.8 \times 10^4$  for malfunctioning versus normal functioning TEPs respectively. This is consistent with the hypothesis that Candidal species are present in biofilms associated with TEP failure, especially with intra-luminal leakage.

**Conclusions:** Malfunction TEPs can be very bothersome to laryngectomy patient as there is a reduced ability to phonate, as well as increases their risk for aspiration of contents from the neopharynx/esophagus. Few previous studies have performed Candidal biofilm analyzation on TEPs from live patients. This study illustrates there is an association of higher Candidal CFUs present in biofilms in these prosthesis. In the future, reduction or prevention of biofilm formation of Candidal species may reduce the need for frequent TEP replacement.

1-059

**HOW MODERN SCIENCE INFORMS THE ART OF  
JACKSON'S "SERMON ON RELAXATION" FOR  
OFFICE-BASED UPPER AIRWAY PROCEDURES**

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No science-based accounting of reduction of patient pain and anxiety has been reported related to office-based procedures of the upper airway. The setting of laryngologic procedures has recently shifted more to an office-based milieu due to excellent safety records, improved endoscopic equipment and interventional options. However, medication administered in the operating room to assure high procedural success and eliminate negative memories is not feasible in the office due in part to a lack of cardiopulmonary monitoring. Yet contemporary otolaryngologists performing these procedures face the same patient-related barriers that Jackson did nearly 100 years ago, namely patient pain and anxiety. To help assure procedural success and prevent negative patient memories, Jackson relied heavily on his self-termed “Sermon on relaxation” • wherein patients were verbally prepared. His elegant descriptions of prevention of pain and anxiety were drawn from experience and he did not benefit from the scientific explosion of the last century from which to draw information. To help ensure ongoing procedural success and the prevention of negative patient memories in our current office-based paradigm we therefore undertook a wide literature search across the fields of Dentistry, Neurology, Anesthesia, Psychology, and Psychiatry to devise rational technical approaches for office-based procedures. We herein report information from this literature search and describe psychological and sensory strategies which are incorporated into office-based procedures for mitigation of pain and anxiety. We have attempted to identify contemporary scientific input to inform a rational and compassionate procedural approach and expand the possibilities of this field.

1-060

**EFFECTS OF PHONATION ON EPITHELIAL  
MORPHOLOGY**

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**Purpose:** The vocal folds are exposed to repetitive trauma during phonation. The vocal fold epithelium bears the brunt of this trauma. However, it is unknown how much damage is sustained at the ultrastructural level. This study utilizes electron microscopy to describe morphological changes in the rabbit vocal fold following phonation.

**Design and Methods:** Twenty New Zealand white breeder rabbits were used for the experiment. Each rabbit was randomly assigned to receive 30 or 120 min of raised intensity phonation or approximation of the vocal folds without phonation (control). The vocal folds were harvested 30 min after phonation. One vocal fold was used for Scanning electron microscopy (SEM), and the contralateral vocal fold was used for Transmission electron microscopy (TEM). Both SEM and TEM were performed on the central region of the middle one-third of the vocal fold. Attention was paid to microprojection structure on SEM, and paracellular width on TEM.

**Summary of Results:** SEM images show a decrease in the density of epithelial surface microprojections in the 120 min raised intensity group compared to 30 min raised intensity group and controls. TEM shows an increase in the paracellular width between adjacent epithelial cells in the 120 min raised intensity group compared to the 30 min raised intensity group and controls.

**Conclusions:** The loss of vocal fold epithelial structure may adversely affect barrier function. Future experiments will be planned to quantify changes in microstructure, as well as to further characterize time and magnitude doses of vibration exposure.

1-061

**MORBIDITY AND PATIENT PERCEPTION  
OF FLEXIBLE LARYNGOSCOPY**

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**Purpose:** Despite decades of use of flexible laryngoscopy, no study has examined patient perception and complications of this procedure. This is germane in light of the Clinical Practice Guidelines which reference potential complications of laryngoscopy to justify delayed imaging. In this study, we prospectively investigated morbidity and patient perception/tolerance of flexible laryngoscopy, as well as the influence of anatomical abnormalities on these findings.

**Study Design/Methods:** Two-hundred consecutive patients completed an IRB-approved survey following flexible laryngoscopy. The survey queried 1) demographics 2) discomfort of pre-treatment anesthesia, scope placement in the nose and pharynx, 3) fear of future examinations, and 4) patient perception and past experience. Concurrently, the clinician completed a corresponding evaluation regarding 1) complications and 2) anatomic variations.

**Results:** A preponderance of males was noted (111, 89 females); average age was 47.9 years. The overall discomfort from anesthetic spray (out of 10) was 2.93, discomfort from scope placement was 3.71, pain associated with the scope was 2.25, and fear of future examinations was 2.6. No statistically-significant differences were observed between genders, except women feared future examinations more ( $p=0.008$ ). Anatomical abnormalities were observed in 17.5% of patients. These patients had no statistically-significant differences in their perception of the nasal spray ( $p>0.1$ ), but had more discomfort, pain, and fear regarding the examination; (4.94/10 ( $p=0.014$ ), 3.25/10 ( $p=0.020$ ), 3.91/10 ( $p=0.008$ )). No complications were observed. Over 95% of patients reported the examination was critical to diagnosis.

**Conclusions:** Flexible laryngoscopy is well-tolerated with minimal risk. Anatomic variations may yield increased discomfort.

1-062

NEW METHOD OF SECONDARY VOICE PROSTHESIS  
INSERTION BY PUNCTURE FROM ESOPHAGEAL  
LUMEN UNDER LOCAL ANESTHESIA

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**Purpose of the Study:** We aim to clear the utility of our new intracorporeal method. Extracorporeally tracheoesophageal puncture methods have been performed until now. However, extracorporeal methods have some weak points, for example, much operation time, much complications and total anesthesia. To overcome these weak points, we have made a clinical trial.

**Method:** Our new intracorporeal puncture method using a flexible laryngoscope can be performed at outpatient clinic under local anesthesia. Briefly, physician inserted endoscopy transnasally for sitting position patient. Puncture is done with needle through endoscope. Next, the slot punctured is expanded with dilator and Provox2 is inserted from esophageal side. We performed clinical trial to clear the utility of our new method for patients with head and neck cancer after total laryngectomy from Apr, 2010 to Sep, 2011. Estimating points are 1) percentage of patients in whom procedure were performed successfully, 2) operation time and 3) adverse effects.

**Summary of Results:** Sixteen of 17 patients (94%) were successfully punctured by our method. Mean operation time is only 13 minutes. All patients can do voice rehabilitation and take peroral intake immediately after operation. No patient has complications on procedures.

**Conclusion:** We performed our new methods for almost patients with ease and low risk. High successful rate and no complications mean the advantage of our method. Our new method is concluded to be recommended for all patients.

1-063

**CRISIS RESOURCE MANAGEMENT  
SIMULATIONS IN OTOLARYNGOLOGY  
RESIDENT TRAINING**

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**Background:** Crisis Resource Management (CRM) has been successfully used by the airline industry for years to teach teamwork and crisis skills in a simulated environment. For 10 years medical specialties such as anesthesia have integrated CRM into their training. This project uses the same principles to apply difficult Ear, Nose, and Throat (ENT) scenarios to the training of otolaryngology residents.

**Objective:** To develop a course for otolaryngology residents that teaches teamwork and CRM skills in a realistic operating room environment. Situation management skills are also obtained by otolaryngology residents in high risk, low frequency airway emergencies.

**Setting:** Scenarios took place in the Surgical Skills Laboratory at a teaching hospital. All simulated operating room suites are identical to real operating rooms within the facility.

**Methods and Results:** Residents were split into groups of three based upon year of training, comprising three groups total. Each group then completed two separate ENT emergency scenarios. Scenarios were evaluated based on the amount of time each group required to resolve the situation as well as the amount of time that the simulated patient displayed low oxygen saturation. Groups reacted differently based on level of training, with an overall trend towards improved care with increased training.

**Conclusion:** CRM simulation can be successfully used to augment and improve resident training in high risk, low frequency emergency situations. Simulated patients under the care of more senior residents fared better in two separate surgical emergencies when comparing resolution of the situation and time with decreased oxygen saturation.

1-064

COMPUTERIZED PATTERN ULTRAPULSE CO2  
LASER: TREATMENT OF CHOICE FOR RECURRENT  
RESPIRATORY PAPILLOMATOSIS?

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**Purpose of the Study:** To assess the effectiveness of Recurrent Respiratory Papillomatosis (RRP) excision using ultrapulsed CO2 laser with the addition of a computerized pattern generator (CO2-CPG).

**Design and Method of Study and Analysis:** We reviewed the charts of all patients consecutively treated with adult onset RRP from 2006 to 2011. All patients underwent serial surgical removal of disease with the CO2-CPG. Outcomes were measured pre and post treatment as a function of: disease burden using Derkay scores, durability of benefit between treatments, stroboscopic evaluation, and vocal improvement through Consensus Auditory-Perceptual Evaluation of Voice (CAPE-V) scoring. All evaluations were performed by blinded experts.

**Summary of Results:** 22 patients underwent 76 procedures. 17 patients were evaluable for long term disease burden with 11(65%) showing reductions in Derkay score between procedures, while 14(82%) showed an overall reduction in burden from the beginning to the end of the study period. Duration of benefit improved in 5 of 13 evaluable for long term benefit. Voice improvements were found in all patients both between interventions and overall for the entire study period.

**Conclusions:** The CO2-CPG is an effective method for the control of RRP. Review of patient series reveals reduction in disease burden, general increase in the required treatment interval, and sustained vocal improvement.



0-165

NEGATIVE DYSTONIA OF THE PALATE: A  
NOVEL ENTITY AND DIAGNOSTIC  
CONSIDERATION IN HYPERNASAL SPEECH

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**Purpose:** 1. To present the first documented series of patients with negative dystonia of the palate including presenting symptoms, clinical findings and management options. 2. To discuss possible etiologies including functional MRI data.

**Study Design:** Case series at a clinical research center

**Methods:** Between July 1980 and October 2011, data was collected on patient demographics, disease characteristics, functional MRI findings and long-term management options and outcomes.

**Results:** There were four included patients (2 males / 2 females). All patients presented with hypernasal speech without associated dysphagia. Associated other cranial and / or limb dystonia was present in 2 patients (50%). Three patients had previously failed oral pharmacologic therapy. Clinical examination of all patients revealed absent palatal movement on speaking despite intact gag reflexes, normal palate elevation on swallowing and normal cranial nerve examinations. Two patients underwent functional MRI studies. Management options included speech therapy and calcium hydroxyapatite injections into the soft palate and Passavant's ridge.

**Conclusions:** This is the first report of negative dystonia of the palate. Examination findings are diagnostic and include absent palatal movement with speech despite normal movement on swallowing and an intact gag reflex. A diagnosis of negative dystonia of the palate should be considered for patients who present with hypernasal speech without associated swallowing abnormalities

1-066

**SURGICAL MANAGEMENT OF AIRWAY  
DYSFUNCTION IN PARKINSON'S DISEASE  
COMPARED WITH PARKINSON-PLUS SYNDROMES**

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**Purpose:** 1. To compare the laryngeal symptoms of Parkinson's disease (PD) with those of Parkinson-plus syndromes (PPS). 2. To clarify the differences in surgical management of upper airway dysfunction in PD versus PPS. 3. To present a treatment algorithm for management of upper airway disorders in PD and PPS.

**Design:** Case series of 40 patients (34 with PD, 6 with PPS).

**Methods:** Data was collected on airway manifestations of each disease including clinical and physiological test results (pulmonary function tests, voice analysis, laryngoscopy, modified barium swallow and sleep testing) and treatment outcomes (surgical and non-surgical).

**Results:** Vocal cord atrophy causing bowing with mid cord glottic gap was common in PD patients and over one third of PD patients assessed underwent vocal cord augmentation with noticeable improvement in vocal volume and phonation time. Half the patents with PPS required tracheostomies for life threatening sleep apnea. Systemic medications and speech therapy were integral components of the treatment regime for all patients.

**Conclusion:** Surgical management of laryngeal disorders in PD should focus on restoring bulk to atrophic vocal cords to minimize glottic gaps, thus improving efficiency of vocalization even in the presence of impaired respiratory effort. Conversely, the autonomic dysfunction that characterizes PPS results in upper airway obstruction and thus surgical management focuses primarily on maintaining an adequate airway and frequently necessitates tracheostomy.

1-067

THE HOW AND WHY OF PRESCRIBING  
PROTON PUMP INHIBITORS: OBSERVATIONS  
FROM A LARYNGOLOGY PRACTICE

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**Purpose:** To examine the patterns of proton pump inhibitor (PPI) usage in patients presenting with voice and swallowing problems.

**Methods:** A prospective observational descriptive study was conducted on patients presenting to a laryngology practice over a six-month period.

**Results:** 68 of the 208 patients (32.6%) presenting during the study period were eligible to participate. The average age was 61.3 years (range 25-93), average BMI was 27.4 (overweight), and 8 (11.8%) were smokers. All patients already had a prescription for a PPI; 3 patients had prescriptions from multiple physicians. General practitioners prescribed 19/72 (26.4%), gastroenterologists 27/72 (37.5%), otolaryngologists 22/72 (30.6%), and other physicians 4/72 (5.6%). 40 patients (58.8%) had tried an antacid or H2-blocker prior to initiating PPI therapy; 28 patients (41.2%) had not tried alternative medications. Behavioral modification recommendations were made to 45 patients (66.2%), but only 7 of 45 (15.5%) overweight or obese patients were recommended weight loss, and none of the 8 smokers were counseled to reduce tobacco use. During the course of treatment, 62/68 patients (91.2%) had at least one diagnostic study (EGD, laryngoscopy, or pH probe) with 50.0% of patients having had more than one test.

**Conclusions:** 1) Physicians inconsistently recommend behavioral change, specifically weight loss and smoking cessation. 2) PPI's are prescribed as first line therapy in almost half of all patients. 3) Diagnostic testing may be overused in this population. Physicians should be mindful to optimize patient care by encouraging behavioral modifications, trying alternative medications, and judiciously ordering invasive and expensive testing.

1-068

**GRANULAR CELL TUMOR OF THE  
CERVICAL ESOPHAGUS: AN UNUSUAL  
CASE OF DYSPHAGIA**

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**Objectives:**

- 1.) Present a case of chronic dysphagia caused by a granular cell tumor of the cervical esophagus.
- 2.) Review the epidemiology, histopathologic characteristics, and treatment algorithm of cervical esophageal granular cell tumors.

**Methods:** Case report and review of the literature.

**Results:** One patient identified in the authors' institution presenting with dysphagia found to have a large cervical esophageal granular cell tumor. Treatment consisted of transcervical excision and local muscle flap repair. The patient did well with no swallow dysfunction post-operatively and remarkably improved esophagram study. Review of the literature reveals less than 20 reported cases of cervical esophageal granular cell tumors.

**Conclusion:** Granular cell tumors of the cervical esophagus are an uncommon entity. Controversy exists on the cell line origin and malignant potential of these lesions. Large symptomatic lesions should be addressed surgically with good results reported.

1-069

COMPARING MAXIMUM PHONATION TIME IN  
HEALTHY YOUNGER AND OLDER ADULTS

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S. Carter Wright, MD  
David Blalock, MA  
Susan G. Butler, PhD  
*Winston-Salem, NC*

**Purpose:** Maximum phonation time (MPT) is a measurement of how long one can phonate a vowel, usually /a/. Normative MPT data have been reported in healthy younger adults and healthy older adults, but no studies have compared MPT between the 2 groups. We sought to compare MPT in healthy younger and older adults and to determine the effects of gender on MPT.

**Design:** Prospective study.

**Methods:** Participants were equally divided into 2 groups: 30 healthy adults between 18 and 40 years of age, and 30 healthy adults over 70 years of age. Participants took a maximal breath and held the vowel sound /a/ for as long as possible in their normal speaking voice. The effects of age and gender were assessed. Mean, standard error of the mean, analysis of variance, and analysis of covariance were used for statistical analysis.

**Results:** There was a statistically significant main effect of gender ( $p = 0.021$ ). Age approached significance ( $p = 0.098$ ). That is, younger adults tended to have longer MPTs than older adults (25.8 seconds [SE = 1.59] and 22.0 seconds [SE = 1.59], respectively). Females had a mean MPT of 21.3 seconds (SE = 1.59), while males had a mean MPT of 26.6 seconds (SE = 1.59). There were no significant interactions.

**Conclusions:** Gender significantly impacted MPT. These results generate an appreciation for separate normative data for gender and age. A larger cohort of participants would determine whether or not age is a significant factor affecting MPT.

1-070

**VARIABILITY IN MANAGEMENT OF  
DYSPHAGIA AMONGST THE DIFFERENT  
MEDICAL SPECIALTIES**

Sunil Verma, MD  
Hossein Mahboubi, MD, MPH  
*Irvine, CA*

**Purpose:** Dysphagia is a common reason for patient visits to a physician. However, the variability in the care provided by different subspecialties for dysphagia has not been well examined. The aim of the study was to analyze the prevalence and demographics of patients with dysphagia, and investigate the differences in management between otolaryngologists and other physicians.

**Methods:** The National Ambulatory Medical Care Survey databases from 2007 to 2009 were analyzed for cases in which dysphagia was listed as a reason for visit. Demographic data, diagnostic and procedural interventions, and patient disposition data were analyzed. Differences in the management between otolaryngologists, primary care physicians and other subspecialists were compared.

**Results:** Annually, approximately 1,800,000 outpatient visits were made due to dysphagia, comprising 0.2% of the total number of visits to a physician and 1.4% of the visits to an otolaryngologist. The mean age of patients was 54  $\pm$  23 years, with 60% of patients being female. Patients were equally likely to see an otolaryngologist, primary care physician or other subspecialist for dysphagia. Otolaryngologists were more likely to perform a laryngeal procedure, while other subspecialists were more likely to order a gastroesophageal procedure. Primary care subspecialists were less likely to order radiographic imaging than otolaryngologists and other subspecialists, but more likely to refer patients to other providers.

**Conclusions:** Dysphagia is a common reason for which patients seek medical care, however, only one third of patients in this database sought medical care from an otolaryngologist. Management patterns vary greatly between different types of physicians.

1-071

**RARE CLINICAL ENTITY: KILLIAN-JAMIESON'S  
DIVERTICULUM CLINICALLY INDISTINGUISHABLE  
FROM A ZENKER'S DIVERTICULUM**

Melynda A Barnes, MD  
Edward J Damrose, MD  
*Stanford, CA*

**Purpose of the Report:** To highlight and discuss the clinical presentation of Killian-Jamieson's diverticulum

**Design and Method of Study and Analysis:** Case report and literature review

**Summary of Results:** The transition from inferior constrictor to cricopharyngeus muscle represents an anatomical vulnerability - Killian's triangle - through which diverticula commonly form. A second vulnerability - the Killian-Jamieson area - between the cricopharyngeus muscle and the esophagus has been described, but diverticula here are rare. A forty-four year old female presented with a five month history of neck pain and swelling. Computed tomography of the neck and barium swallow demonstrated what appeared to be a 5cm Zenker's diverticulum. She denied dysphagia, regurgitation of undigested food, weight loss, or Broyle's sign. Because of the unusual clinical presentation, hypopharyngoscopy and esophagoscopy was performed which showed no evidence of a Zenker's diverticulum but a cervical esophageal diverticulum emanating through Killian-Jamieson's area, immediately below the cricopharyngeus muscle. The bar interpreted on esophagram as consistent with the cricopharyngeus muscle was actually the hypertrophied lip of the diverticulum. While radiographic evaluation in this patient was consistent with a possible Zenker's diverticulum, her clinical presentation was atypical, prompting endoscopy and accurate diagnosis. Because of its unique relationship with the esophageal wall, we feel endoscopic stapling is contraindicated, and that transcervical excision is the most appropriate treatment modality.

**Conclusions:** Killian-Jamieson's diverticulum is a rare entity, radiologically similar to a Zenker's diverticulum but clinically distinct, and with fewer treatment options.

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