

The Program

of

The Eighty-Seventh Annual Meeting

of

**THE AMERICAN
BRONCHO-ESOPHAGOLOGICAL
ASSOCIATION**

**Thursday and Friday
April 26-27, 2007**

**Manchester Grand Hyatt
San Diego, CA**



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.

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 (ACS) and the American Broncho-Esophagological Association (ABEA). The ACS is accredited by the ACCME to provide continuing medical education for physicians.

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

EDUCATIONAL OBJECTIVES (cont.)

Disclosure

In accordance with ACCME and ACS policies, all faculty members will disclose relevant financial relationships with commercial entities and will disclose their intent to discuss drugs or devices or the uses of drugs or devices that have not been approved by the Food and Drug Administration (FDA)

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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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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 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 educational activity for a maximum of 7.25 *AMA PRA Category 1 Credits™*. Physicians should only claim credit commensurate with the extent of their participation in the activity.



Division of Education

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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CHAIRS, and REPRESENTATIVES
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THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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Andrew Blitzer, MD, DDS – New York, NY

Michael Setzen, MD – Manhasset, NY

12:30 PM

Thursday, 26 April 2007

**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

Granting of Senior Membership Status

Allan L. Abramson, MD, FACS

Thomas C. Calcaterra, MD

Edward Gaynor, MD

Fifty-Year Certificates

None

In Memoriam –

David W. Brewer, MD

Enje T. Edens, MD

Jerome A. Higler, MD

Robert M. Hui, MD

Julian Lee, MD

Nael Martini, MD

Fernand Montreuil, MD

Election of Nominating Committee

Appointment of Auditing Committee

New Business

Old Business

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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1917	Chevalier L. Jackson, MD
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1941	W. Likely Simpson, MD
1942	Robert L. Morehead, MD
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1944	Carlos E. Pitkin, MD
1945	Carlos E. Pitkin, MD
1946	Robert M. Lukens, MD
1947	Millard F. Arbuckle, MD
1948	Paul H. Holinger, MD
1949	Leroy A. Schall, MD
1950	Chevalier L. Jackson, MD
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1953	Edwin N. Broyles, MD
1954	Clyde A. Heatly, MD
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1956	Clarence W. Engler, MD
1957	Walter B. Hoover, MD
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PRESIDENTS

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1961	Alden H. Miller, MD
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1964	Charles N. Norris, MD
1965	Daniel C. Baker, Jr., MD
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1968	Charles F. Ferguson, MD
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1970	Richard W. Hanckel, MD
1971	John R. Ausband, MD
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2003 Charles N. Ford, MD
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2005 Jonathan E. Aviv, MD
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THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

1:00 PM

Thursday, 26 April 2007

PRESIDENTIAL WELCOME

GADY HAR-EL, MD

Brooklyn, NY

PROGRAM OVERVIEW:

ELLEN DEUTSCH, MD

Wilmington, DE

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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Thursday, 26 April 2007

INTRODUCTION OF GUEST OF HONOR

Gady Har-El, MD
President

1:06 PM GUEST OF HONOR:

FRANK E. LUCENTE, MD*
Brooklyn, NY

Challenges in Preparing Residents for Practice

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

GUESTS OF HONOR
1951–2007

1951	Fernand Eeman, MD – Ghent, Belgium
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1961	W. Likely Simpson, MD – Memphis, TN
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1963	Sam E. Roberts, MD – Kansas City, MO
1964	Lyman Richards, MD – Wellesley Hills, MA
1965	Berling K. Hart, MD – Charlotte, NC
1966	Julius W. McCall, MD – Cleveland, OH
1967	Francis W. Davidson, MD – Danville, PA
1968	Dean M. Lierle, MD – Iowa City, IA
1969	Leroy A. Schall, MD – Barnstable, MA
1970	Herman J. Moersch, MD – Rochester, MD
1971	Louis Clerf, MD – Saint Petersburg, FL
1972	Joseph P. Atkins, MD – Philadelphia, PA
1973	Ricardo T. Acuna – Mexico City, Mexico
1974	Paul H. Holinger, MD – Chicago, IL
1975	Arthur M. Olsen, MD – Rochester, MN
1976	Francis LeJeune, MD – New Orleans, LA
1977	Alden H. Miller, MD – Los Angeles, CA
1978	Charles Norris, MD – Philadelphia, PA
1979	Charles F. Ferguson, MD – Osterville, OH
1980	Emily Lois Van Loon, MD – Philadelphia, PA
1981	Donald Proctor, MD – Baltimore, MD
1982	Frank D. Lathrop, MD – Pittsford, VT
1983	John E. Bordley, MD – Baltimore, MD
1984	Gabriel F. Tucker, MD – Chicago, IL
1985	Stanton A. Friedburg, MD – Chicago, IL
1986	F. Johnson Putney, MD – Charleston, SC
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1989	Paul H. Ward, MD – Los Angeles, CA
1990	D. Thane R. Cody, MD – Jacksonville, FL
1991	M. Stuart Strong, MD – Boston, MA
1992	Bruce Benjamin, MD – Sydney, Australia
1993	David R. Sanderson, MD – Scottsdale, AZ
1994	Michael E. Johns, MD – Baltimore, MD
1995	John A. Kirchner, MD – Woodbridge, CT
1996	Robert W. Cantrell, MD – Charlottesville, VA
1997	Eiji Yanagisawa, MD – New Haven, CT
1998	Lauren Holinger, MD – Chicago, IL
1999	William R. Hudson, MD – Durham, NC
2000	Robert H. Ossoff, DMD, MD – Nashville, TN
2001	Trevor J. I. McGill, MD – Boston, MA
2002	Flavio Aprigliano, MD – Rio de Janeiro, Brazil
2003	Stanley M. Shapshay, MD – Boston, MA
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2007 Frank W. Lucente, MD – Brooklyn, NY

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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Thursday, 26 April 2007

SESSION I: AIRWAY ISSUES

Moderator: Gregory Grillone, MD
Boston, MA

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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.

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1988	Richard A. Kosarek, MD
1989	(no award)
1990	Thomas F. Dowling, MD James A. 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
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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 Juichi Ito, MD Yasuhiko Shimizu, MD

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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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*

1:18 PM

Thursday, 26 April 2007

BROYLES-MALONEY AWARD

Presenter: Gady Har-El, MD

Recipient:
J. SCOTT McMURRAY, MD
Madison, WI

Cidofovir Efficacy in RRP: A Prospective Blinded Placebo-Controlled Study

Charles N. Ford, MD
Nadine P Connor, PhD*
Madison, WI

PURPOSE: To determine efficacy of cidofovir in treatment of severe recurrent respiratory papillomatosis (RRP). While results of case-series suggest that cidofovir may decrease frequency and rapidity of papilloma regrowth, no blinded placebo-controlled studies have demonstrated efficacy.

DESIGN: Prospective, double-blind, placebo-controlled, longitudinal adjuvant therapy trial.

METHODS: Adults and children (n_) with aggressive RRP received either active drug (cidofovir) or placebo. When surgical intervention was needed, drug or placebo was injected into affected areas after surgical removal of disease. The following measures were made at baseline and at two month intervals for the course of 12 months: Derkay papilloma grading scale, Voice Handicap Index (VHI), health-related quality of life (HR-QOL), and total number of procedures performed over 12 months.

SUMMARY OF RESULTS: At 2 and 12 month follow-up, there was a significant ($p < .05$) improvement in the Derkay score within cidofovir and placebo groups, but no difference between groups, and no difference in number of procedures performed between groups. Significant improvement was found in VHI scores in the cidofovir group at 12 month follow-up. No differences were seen in HR-QOL.

CONCLUSIONS: A randomized, blinded, placebo-controlled trial is necessary in the study of RRP because natural history of the disease can include remissions and reactivations. We found a significant improvement in papilloma score (Derkay) at 12 months following baseline assessment in patients treated with cidofovir. This effect, however, was also seen in the placebo group. Accordingly, we were unable to provide proof of efficacy of cidofovir in the treatment of RRP.

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Thursday, 26 April 2007

**Angiocatheter Balloon Dilation Treatment of
Subglottic Stenosis**

Nicole Maronian, MD

Cleveland, OH

Bond Almand, MD*

Knoxville, TN

PURPOSE: The ideal management of recurrent subglottic stenosis (SGS) remains unclear. Standard methods with laser or bronchoscopic dilation may result in mucosal trauma, thereby worsening the underlying tendency toward re-stenosis. A more atraumatic, yet effective method of dilation utilizing the angiocatheter dilating balloon was tested with the goals of improving outcomes and reducing the need for repeat dilation.

STUDY DESIGN: A retrospective review of angiocatheter balloon dilation (n_) for treatment of SGS compared to standard treatment with bronchoscopic dilation (n_).

METHODS: Medical records, as well as video images of patient subglottic airway diameters before and after treatment, were reviewed.

RESULTS: 18 patients underwent angiocatheter balloon dilation for the following etiologies: idiopathic (n), autoimmune (n), other (n). They were compared with 12 patients who had previously undergone standard bronchoscopic dilation. Bronchoscopic dilation improved the airway diameter from 4.6-6.7mm ($p<.03$) while the area increased from 17.9-39.8 mm² ($p<0.049$). With angiocatheter dilation, the airway diameter improved from 5.2-9.8mm ($p<0.005$) while the subglottic area improved from 24.3-77 mm² ($p<0.005$). 62.5% of patients treated with bronchoscopic dilation required a repeat dilation while only 25% of patients treated with angiocatheter dilation required subsequent procedures.

CONCLUSION: Angiocatheter balloon dilation is an effective endoscopic treatment of SGS. In comparison to standard bronchoscopic dilation, we found improved post-op airway diameter and subglottic area. A trend towards decreased incidence of symptomatic re-stenosis and need for repeat dilations with the angiocatheter technique was also noted.

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Thursday, 26 April 2007

**Management of Adult Idiopathic Subglottic Stenosis
with Balloon Dilatation**

Kenneth H. Lee, MD, PhD*

Michael J. Rutter, FRACS

Cincinnati, OH

PURPOSE: Evaluate the efficacy of balloon dilatation for management of isolated idiopathic subglottic stenosis in the adult population.

METHODS: Adults with airway obstruction symptoms classified as idiopathic subglottic stenosis based on history and findings of a single discrete stenotic area on microlaryngoscopy and bronchoscopy were included in this series. Patients meeting these criteria were dilated with a 10 to 14 mm balloon in a single procedure or in 2 consecutive dilatations within 7 days. Patients were followed for up to 24 months post-dilatation.

RESULTS: Four patients met the criteria. One of the four had prior laser treatments and a cricotracheal resection. One patient had a previous scar band lysis procedure. The remaining two patients had no prior procedures. The airway sizes prior to dilatation ranged from a 2.5 to 5.0 endotracheal tube. In all cases the airway was dilated to 2.0 to 3.5 endotracheal tubes larger than the initial size. To date, 3 patients have been followed for 6 to 24 months without symptoms of recurrent airway stenosis. One patient was symptom free for 22 months then presented with progressive airway difficulty following an upper respiratory tract infection and has undergone a repeat dilatation. No patients had adverse effects or complications from the procedure.

CONCLUSIONS: Balloon dilatation of idiopathic subglottic stenosis in adults is a safe and efficacious method to manage this disease entity for cases of isolated and discreet lesions. Patients undergoing a single procedure have remained symptom free for up to 24 months following balloon dilatation.

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Thursday, 26 April 2007

**Cricotracheal Resection in Non-Tracheotomized
Adults: A Prospective Case Series**

Christian Sittel, MD, PhD

Sebastian Blum, MD*

Alexandra Streckfuss, MD*

Peter K. Plinkert, MD, PhD*

Heidelberg, Germany

Cricotracheal resection (CTR) is a modern technique of airway reconstruction in case of subglottic stenosis (SS). We report a case series of adult, non-tracheotomized patients. 15 patients with significant SS were identified, presenting with dyspnea and stridor. Grade of stenosis was III in 14 cases and II in 1 case, according to the Cotton-classification. Etiology was manifold, with intubation and tracheotomy being the predominant risk factors. CTR was performed in all cases with pre-and postoperative video tracheoscopy.

Mean postoperative intubation time was 41, 7 hours (11-103 hours); mean length of ICU-stay was 2, 6 days (3-9 days). Video tracheoscopy for reassessment was performed after 69 days in the average. In 13/15 patients the subglottic lumen had been normalized. In 1 case a restenosis could be managed with repeated endoscopic interventions. 1 patient died at post-OP day 4 due to a fulminant pulmonary embolism. Further complications comprised 1 axillary vein embolism, ventilator-associated pneumonia in 4 cases and 1 transient unilateral recurrent nerve palsy, which recovered completely.

CTR is a reliable and versatile technique for reconstructing the subglottic airway, almost regardless of the underlying etiology. Most complications observed have not been associated directly to the procedure, but reflect the complex morbidity of the patient population. There seems to be an increased risk for thrombo-embolic incidents, which may be attributable to pre-operative immobilization of the dyspneic patients.

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Thursday, 26 April 2007

How Does Cricotracheal Resection Affect the Voice?

Marshall E. Smith, MD

Nelson Roy, PhD*

Kelly Stoddard, MS*

Salt Lake City, UT

PURPOSE OF STUDY: To measure the effects of cricotracheal resection procedure on the voice.

STUDY DESIGN AND ANALYSIS: Voice recordings were taken of 11 female patients who underwent cricotracheal resection procedure to treat chronic airway obstruction associated with idiopathic laryngotracheal stenosis. Recordings were taken before and after the procedure, from three months to one year postoperatively. The recordings were analyzed using voice analysis software. Measures included fundamental frequency (F0) of sustained vowel at comfortable pitch/loudness, connected speech, pitch range, maximum phonation time. A voice handicap index survey was also taken.

SUMMARY OF RESULTS: On group average measures, speaking F0 lowered significantly by 31 Hz, from 191 Hz to 158 Hz (p02). In seven patients the speaking F0 was below 160 Hz. Sustained vowel frequency also dropped by 40 Hz (p18). F0 range reduced by an average of 7.9 semitones, from 20.6 to 12.7 (p08). Maximum phonation time did not change significantly.

CONCLUSIONS: Cricotracheal resection can have a notable impact on the voice in women. It often lowers the pitch of the speaking voice into the male range and reduces the pitch range of the voice. The change in voice that often accompanies this procedure should be discussed with patients in pre-operative counseling.

1:48 PM

Thursday, 26 April 2007

**The Impact of Treatment of Laryngopharyngeal
Reflux on Obstructive Sleep Apnea/Hypopnea
Syndrome**

Michael Friedman, MD

Ramakrishnan Vidyasagar, MBBS, MS*

Paul Schalch, MD*

Ninos J. Joseph, BS*

Chicago, IL

ABSTRACT: OBJECTIVE: This study was designed to test the hypothesis that treatment of LPR can improve obstructive sleep apnea/hypopnea syndrome (OSAHS).

Setting: A prospective, clinical trial in a tertiary care center in two phases. Phase 1 involved screening of all patients with OSAHS using 24 hr pH monitoring studies. Those patients with positive pH studies and willing to undergo treatment were enrolled in Phase 2, which required post treatment pH study and polysomnogram (PSG).

METHODS: 81 patients with symptoms and signs of OSAHS underwent complete history and physical, including questions related to LPR/GERD symptoms, polysomnography (PSG), 24 hr wireless pH study, snoring and Epworth Sleepiness Scale, and quality of life (QOL) survey. Patients who tested positive for LPR were treated with esomeprazole magnesium 40 mg QD for two months. After two months, PSG, pH study, QOL survey, and subjective data collection were repeated.

RESULTS: The incidence of LPR in patients with OSAHS was 71.4%. In the 32 patients participating in Phase 2, snoring level decreased from 8.7 ± 2.1 to 6.9 ± 2.6 (p09), daytime sleepiness decreased from 14.4 ± 3.5 to 11.2 ± 2.5 (p21), AHI from 33.5 ± 21.6 to 30.1 ± 12.3 (p12), and minO₂ saturation increased from 85.7 ± 8.3 to 87.1 ± 5.0 (p16).

CONCLUSIONS: Although no patient was cured by proton-pump inhibitor therapy alone, the study identified the following important points. First, LPR is extremely common in patients with OSAHS (71.4%). Secondly, treatment of LPR had a significant impact on reduction of apnea hypopnea index, snoring and daytime sleepiness and improving minimum oxygen saturation.

**Efficacy of Weight Loss in the Long-Term
Management of Chronic Upper Airway Obstruction**

Ryan C. Case, BS*

John M. Schweinfurth, MD

Jackson, MS

OBJECTIVE: Obesity contributes to oxygen demand and dynamic airway obstruction and therefore morbidity in patients with airway obstruction. The objective of the current study is to determine the long-term success of conservative measures directed towards weight loss and therefore reduced oxygen demand on successful airway management.

METHODS: Patients with chronic airway obstruction were followed prospectively over 2 years. Information regarding age, sex, starting and ending weights, type of obstruction, comorbidities, and follow-up information was recorded. Patients were prescribed a weight loss regimen and referred to a registered dietician for counseling. Primary outcome measures were weight loss and rate of decannulation.

RESULTS: Of 13 patients, 9 remained tracheostomy dependent due to obesity and 4 had high grade tracheal lesions and dyspnea amendable to weight loss. The average number of clinic visits per patient was 8.7. The mean change in weight per patient was a net gain of 7.4 lbs with a range (-) 9 lbs to (+) 37 lbs. No patients were decannulated in the study period.

CONCLUSIONS: Significant weight loss was not a viable alternative for patients in the current study. This may be due to comorbid diseases highly prevalent in this population including diabetes, heart disease, poor compliance, and difficulty accessing bariatric surgery services. Despite the stigma and expense of maintaining a tracheotomy, many patients are unable to lose the weight needed to avoid tracheostomy. Although the theoretical benefits of weight loss support its continued recommendation in this population, the chance for long-term success is low.

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

2:00 PM

Thursday, 26 April 2007

DISCUSSION

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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Thursday, 26 April 2007

PRESIDENTIAL ADDRESS:

GADY HAR-EL, MD

Brooklyn, NY

**Doctor, Can You Do It With a Laser?
The Impact of Technology on Patient
Expectations**

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

Thursday, 26 April 2007

SESSION II: SPEECH, SWALLOWING

Moderator: Dana M. Thompson, MD, MS
Cincinnati, OH

**Pediatric Voice-Related Quality of Life:
Findings in Healthy Children and in Common
Laryngeal Disorders**

Albert Merati, MD
Kristina Keppel, APNP*
Nicole M. Braun, RN*
Joseph E. Kerschner, MD*
Milwaukee, WI

OBJECTIVES/HYPOTHESIS: Though several instruments have been validated to assess voice quality in children, the incidence and degree of vocal impairment in normal, healthy children has not been reported. It is hypothesized that healthy children outside of a medical setting do not demonstrate any impairment as measured by the Pediatric Voice-Related Quality of Life (PVRQOL) instrument; furthermore, it is hypothesized that patients with common laryngeal disorders, such as vocal fold paralysis (VFP), vocal nodules (VN), and paradoxical vocal fold dysfunction (PVFD) have significant impairment when compared to the PVRQOL reported by healthy children.

METHODS: The PVRQOL, a validated outcomes instrument, was used prospectively to measure self-reported vocal quality children with VFP, VN, and PVFD. These results were compared to PVRQOL results in a series of 100 children surveyed at the Wisconsin State Fair. PVRQOL scores may range from 0(complete dysfunction) to 100(no dysfunction).

RESULTS: Of the 100 surveys of healthy children and their parents, 95 were completed correctly (range 4-18 years, mean 9.8), the mean PVRQOL reported by these children was 96.8+/-5.85, representing no significant vocal complaints among healthy children. In contrast, patients with VCP (n=, mean 4.4 years, PVRQOLp.5+/-28.6) revealed significantly impaired voice-related QOL (p<0.0001, unpaired t-test). This was also true of patients with vocal nodules (n=, mean age 7.3, PVRQOL,,.8+/-9.4, p<0.0001) and PVFD(n=, mean age 13, PVRQOL‡.4+/-13.8, p<0.0001).

CONCLUSIONS: The PVRQOL in healthy children reveals essentially no self-reported vocal impairment. In contrast, common laryngeal disorders such as VN, VFP, and PVFD demonstrate statistically significant impairment compared to these normals. This is the first report of normative PVRQOL data in children.

2:24 PM

Thursday, 26 April 2007

**Pitch Deviation Analysis of Connected Speech Using
Pathologic Voice**

John Brandon Laflen, PhD*

Cathy L. Lazarus, PhD*

Milan R. Amin, MD

New York, NY

PURPOSE: Voice analysis relies on perceptual rating of vocal quality, which suffers from inter- and intra-rater variability. Objective voice assessments are possible, but are currently limited to sustained phonation and do not extend to connected speech. This study compares normal and pathologic voices using a novel voice analysis algorithm to study pitch deviation during connected speech. The aim of the study is to demonstrate whether the algorithm can distinguish between normal and pathologic voices using connected speech.

METHODS: Adult vocalizations from normal subjects and patients with known benign free edge vocal fold lesions were analyzed. Recordings were previously obtained in quiet using a digital audio recorder with a mouth-to-mike distance of 20 cm. The microphone was calibrated for sound intensity (dB SPL). Two phrases and sustained /a/ were recorded per subject. The subject populations consisted of 10 normal and 26 abnormal subjects.

The voice analysis algorithm generated spectra that represent pitch deviation (jitter) within variable window widths. Statistics were collected from these spectra for window widths between 10 ms and 250 ms. A t-test was used to assess each statistic's discrimination between the normal and abnormal populations.

RESULTS: The p-values for jitter were 0.100, 0.025, and 0.04 for /a/, "aba", and "how are you?" In contrast, maximum deviation over a 30 ms window scored a p-value of 0.004 in the connected speech phrase "how are you?"

Conclusions: These results demonstrate that the algorithm distinguishes between normal and abnormal populations using connected speech. Further, the algorithm achieves improved discrimination over jitter.

2:30 PM

Thursday, 26 April 2007

Chronic Salivary Aspiration: A Role for Botulinum Toxin Treatment of the Salivary Glands

Tejas H. Raval, MD*

Clark A. Elliott MD, FRCSC*

Boston, MA

PURPOSE: Chronic salivary aspiration can cause major pulmonary morbidity in the neurologically impaired patient. A variety of medical and surgical treatments aim to address this problem, some with significant side effects or complications. Botulinum toxin type A injection into the salivary glands has been shown to reduce salivary flow without major complications. Few reports exist regarding the efficacy of this treatment in the prevention of recurrent aspiration pneumonia. We report a retrospective study of patients treated with botulinum toxin for the treatment of recurrent salivary aspiration and pneumonia.

DESIGN/METHOD: A Retrospective chart review of 15 patients ranging in age from 6 months to 37 years treated with botulinum toxin injections at a single tertiary care institution. Botulinum toxin injections were administered to bilateral parotid and submandibular glands with ultrasound guidance. The number of pulmonary infections and hospitalizations before and after the initiation of treatment is compared.

RESULTS: All patients demonstrated improvement in the number of hospitalizations and pulmonary infections following botulinum toxin injections. Improvements also included decreased oxygen requirements, reduced requirement of anticholinergic medication, and reduced need for respiratory therapy. There were no complications of treatment.

CONCLUSIONS: Botulinum toxin injection into the major salivary glands can be effective in reducing pulmonary morbidity and recurrent hospitalization in the neurologically impaired patient. This simple technique offers an alternative to the use of anticholinergic medications and is a less invasive option than surgery, with minimal complication. The use of ultrasound provides accurate targeting of salivary tissue.

Human Child Deglutition During Sleep

Kiminori Sato, MD, PhD
Tadashi Nakashima, MD
Kurume, Japan

Deglutition is a vital function, and the clearance of the pharynx by deglutition is important in protecting the airway. We reported the pattern of human adult deglutition during sleep at the 2005 ALA meeting. In this paper we investigated the pattern of child deglutition during sleep.

Deglutition during sleep was examined in ten normal human children, ranging in age from 6 to 13 years, via time-matched recordings of polysomnography, and surface electromyography (EMG) of the thyrohyoid and suprahyoid muscles.

During sleep, deglutition was episodic, and was absent for long periods. The mean (SD) number of swallows per hour during the total sleep time was 2.8 (1.7). The mean period of the longest absence of deglutition was 59.7 (20.3) minutes. Most deglutition occurred in association with spontaneous electroencephalographic arousal in rapid eye movement (REM) sleep and non-REM sleep. Deglutition was related to sleep stage. The mean number of swallows per hour was 27.4 (27.4) during stage 1 sleep, 3.1 (3.5) during stage 2 sleep, 2.8 (3.3) during stage 3 sleep and 0.9 (0.8) during stage 4 sleep. The deeper the sleep stage became, the lower the mean deglutition frequency became. The mean number of swallows per hour was 2.2 (2.1) during REM sleep. The EMG amplitude dropped to the lowest level of recording during REM sleep.

Child deglutition, a vital function, was infrequent during sleep.

DISCUSSION

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

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Thursday, 26 April 2007

BREAK WITH EXHIBITORS

3:15 PM

Thursday, 26 April 2007

INTRODUCTION BY GADY HAR-EL, MD

OF

CHEVALIER JACKSON LECTURE

PEAK WOO, MD

New York, NY

3:17 PM

Thursday, 26 April 2007

**Interventional Laryngology – Our Heritage to the
Future**

Peak Woo, MD

New York, NY

Office based laryngeal intervention used to be a routine part of the otolaryngology's armamentarium for treatment of laryngeal diseases. Both Mackenzie and Jackson performed routine surgical interventions under local anesthesia. With the advent of general anesthesia and microlaryngoscopy, the office has become more a diagnostic center with surgical interventions relegated to the operating room. With new and changing technology, demographics and economic pressures, office based intervention is proving to be a cost and therapeutically effective alternative in treatment of a variety of laryngeal diseases. Today, office laser applications, office biopsies, office injections and injection laryngoplasties are now routinely done for a variety of benign to malignant diseases of the larynx. The techniques include applications through therapeutic fiberoptic laryngoscopes, indirect instruments with rigid endoscopes, and trans-cervical interventions with video-endoscopy feedback.

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The purpose of this paper is to review the authors' experience in 500 cases of office interventional laryngeal procedures done under local anesthesia. These procedures were performed over the last 10 years. The indications for laser treatment now include hemorrhagic polyps, keratosis, varix, papilloma, granuloma and scar softening. Office applications and injections into the larynx now include the use of steroid, Mitomycin, and Cidofovir. Office laryngeal biopsies include brush biopsies and cup biopsies where general anesthesia is to be avoided. Office granuloma removal and scar lysis can be achieved with a minimum of instrumentation. Trans-cervical injection laryngoplasty using micronized dermis and other alloplastic materials is now possible without patient discomfort. The key to successful office intervention is patient selection and local anesthesia. The anesthetic techniques for indirect rigid and fiberoptic videolaryngoscopic interventions will be highlighted.

With office interventions that require touching the mucosa and removal of tissue, the success rate is lower than those performed with a fiberscope and a non-touch technique. With the newer laser fibers and wavelengths that can be applied as a no touch technique, the success rate of performing office procedures have increased from 93% to 99%. Many procedures can be performed in a fraction of the time as compared to micro-laryngoscopy under general anesthesia.

The future of office interventional laryngology is bright. While it does not replace micro-laryngoscopy, new technologies such as new video-fiberscopes coupled to new laser fibers can offer a less invasive alternative. New laser wavelengths offer the prospect of tissue specific targeting while sparing surrounding tissues.

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Thursday, 26 April 2007

**SESSION III: PRACTICAL BRONCHO-
ESOPHAGOLOGY**

Moderator: Marc Remacle, MD, PhD
Yvoir, Belgium

3:32 PM

Thursday, 26 April 2007

**Preoperative Laryngeal Nerve Screening for
Revision Anterior Cervical Spine Procedures**

Randal C. Paniello, MD

Katherine J. Martin-Bredahl, RN*

Lori J. Henkener, MA, CCC-SLP*

K. Daniel Riew, MD*

St. Louis, MO

OBJECTIVE: Anterior cervical spine procedures carry an inherent risk of recurrent laryngeal nerve (RLN) injury. Patients with persistent RLN paresis may be asymptomatic due to compensation from the opposite side. If such patients undergo an opposite-side anterior approach for revision surgery, they are at risk for injury to the second RLN, creating the potential for bilateral vocal fold paresis and possible need for tracheotomy. A program of routine screening for laryngeal paresis was implemented for these patients. This study reviews the results of this program.

STUDY DESIGN: Retrospective review.

METHODS: Patients referred for preoperative laryngeal nerve screening were identified. Their charts were reviewed for the results of the videolaryngoscopic exam, and any recommendations made on this basis. Relevant history and other physical findings were recorded.

RESULTS: 32 patients met inclusion criteria, of which 22 (69%) had undergone a single anterior cervical approach, and 10 (31%) had undergone more than one. Seven of the patients (22%) had abnormal laryngeal findings, including paresis or paralysis in 6 (19%), of which 4 were asymptomatic. The findings resulted in a recommendation of a cervical approach from the already-involved side. None of the revision procedures resulted in bilateral vocal fold paralysis.

CONCLUSION: Asymptomatic vocal fold paresis occurs in a significant proportion of patients after anterior cervical spine procedures, and revision surgery from the opposite side puts the patient at risk for bilateral involvement. Simple preoperative videolaryngoscopic screening can identify these patients and prevent this devastating complication.

3:38 PM

Thursday, 26 April 2007

**Tracheal Tube Cuff Pressures: Results with Two
ICU Management Strategies**

Luc G. Morris, MD*

Richard A. Zoumalan, MD*

Milan R. Amin, MD

New York, NY

PURPOSE OF STUDY: Tracheal tube cuff over-inflation is a recognized risk factor for tracheal injury and stenosis. Recent international studies report a 27-62% incidence of cuff over-inflation among intensive care unit (ICU) patients. However, there is no recent data from the United States, and there is no data on tracheotomy tubes. It is unknown whether routine cuff pressure measurement is beneficial. We sought to determine the incidence of cuff over-inflation in the contemporary American ICU, under different management protocols.

METHODS: An IRB approved prospective, observational study was conducted at two tertiary-care academic hospitals. ICU patients ventilated via appropriately sized orotracheal or tracheotomy tubes were included. At Hospital A, cuff pressures are assessed by palpation; at Hospital B, cuff pressures are measured every 1-2 days. A hand-held aneroid manometer was used to measure cuff pressures via the pilot balloon. Cuffs were considered over-inflated above 25cm H₂O.

RESULTS: 115 patients were enrolled, 63 at Hospital A and 52 at Hospital B. Overall, 44 patients (38%) had over-inflated cuffs. The incidence of over-inflation was identical at the two hospitals (38%, chi-square p99). 43% of endotracheal tubes were over-inflated, as were 32% of tracheotomy tubes (not significant, Fisher exact test p24).

DISCUSSION: Despite increasing awareness among intensivists and respiratory therapists, the incidence of tracheal tube over-inflation remains high, with both orotracheal and tracheotomy tubes. Our institution's cuff pressure protocol did not reduce the incidence of over-inflation, suggesting that more frequent measurement may be necessary.

**An Institutional and Comprehensive Review of
Laryngeal Leukoplakia**

Jason S. Isenberg, MD, PhD*

Daniel L. Crozier, BS*

Seth H. Dailey, MD

Madison, WI

The nature and interpretation of vocal fold leukoplakia has been limited by small study sizes. The present study reviewed institutional data and the published literature to better characterize vocal fold leukoplakia. At our institution, the histopathology, age, and malignant conversion rates of 136 patients (208 biopsies) with vocal fold leukoplakia were reviewed from 1990-2005. No dysplasia (ND), mild/moderate dysplasia (MM) and severe dysplasia/SCCa *in situ* (SS) was identified in 110/208 (53%), 38/208 (18%) and 29/208 (14%) of these biopsies. The average age of patients with ND, MM and SS was 59.8, 63.8 and 65.3 years, respectively. Following 30 (1-134) months, eight patients underwent malignant change on subsequent biopsies. Additionally, a literature search was performed from 1965-2005 for MESH subjects “pre-malignant laryngeal lesions, laryngeal dysplasia, vocal cord dysplasia or hyperkeratosis of the larynx”. 16 manuscripts were included. Including our institutional data, 1259/2453 (52%) biopsies revealed ND. MM and SS was present in 717/2140 (34%) and 375/2471 (15%) of these biopsies. SCCa developed in 51/1358 (4%), 83/824 (10%) and 56/310 (18%) of the patients with biopsies initially demonstrating ND, MM and SS. In conclusion, over half of all leukoplakia lesions biopsied showed ND. However, these lesions are associated with an increased risk of developing SCCa. Increased age at initial biopsy is seen with increased severity of dysplasia. Importantly, the risk of developing malignancy appears to correlate with the severity of dysplasia present on initial biopsy. Future studies, including genomic evaluation of this lesion, may further characterize its biologic behavior

3:50 PM

Thursday, 26 April 2007

**Transoral Laser Microsurgery (TLM) for Cancer of
the Tonsil: An Analysis of 93 Cases**

Alexios Martin, MD*
Hans Christiansen, MD*
Wolfgang Steiner, MD
Goettingen, Germany
Martin C. Jaeckel, MD*
Darmstadt, Germany
Martina Kron, PhD*
Ulm, Germany

INTRODUCTION: standard treatment modalities for tonsillar cancer are open surgery with reconstruction and primary (chemo-) radiotherapy. Purpose of this study was to analyze, if transoral laser microsurgery (TLM) could be a therapeutic alternative under oncological and functional aspects.

PROCEDURES: a retrospective chart analysis was carried out. Patients with previously untreated cancer of the tonsil were included. Exclusion criteria were pre-treatment, simultaneous second primary cancers and N3 neck disease. 93 patients matched the inclusion criteria and were treated by TLM with -mainly delayed-selective neck dissection (95%) and/or postoperative radiotherapy (65%).

RESULTS: 93 patients were included, 14% belonged to stage I and II (UICC/AJCC 2002) and 86% to stage III and IVa. The median follow-up was 48 months. 5-year Kaplan-Meier local control was 89% for pT1, 77% for pT2, 71% for pT3 and 73% for pT4a. 5-year Kaplan-Meier recurrence-free survival was 62% for stage I and II, 63% for stage III and 61% for stage IVa. These figures are discussed thoroughly.

CONCLUSIONS: our data supports the conclusion, that TLM should be considered a therapeutical option regarding cancer of the tonsil. Oncological and functional results are comparable, while morbidity and complications tend to be lower.

3:56 PM

Thursday, 26 April 2007

Prediction of Difficult Laryngoscopies in the Obese

Adrianna Hekiert, MD*

Rosemarie Mick, MS*

Natasha Mirza, MD

Philadelphia, PA

PURPOSE: 1) To determine if body mass index (BMI), neck circumference and Mallampati score can predict difficult laryngeal exposure (DLE) in obese patients, 2) to ascertain if various laryngoscopes and maneuvers can help improve intraoperative visualization of the glottis.

METHODS: A prospective study over a six-month period of 44 patients undergoing elective direct laryngoscopies was undertaken. Nineteen patients met the criteria for obesity (BMI > or 0 kg/m²). Measurements of height, weight, neck circumference, and Mallampati scores were recorded. The degree of difficulty in obtaining a binocular stereoscopic view and magnification, illumination and suspension was recorded on a visual analog scale (VAS) of 1-10. Difficult laryngeal exposure was defined as VAS > 2. The predictive value of neck size, BMI and Mallampati score was investigated.

RESULTS: In the study there were 19 obese and 25 non-obese patients. 68.4 % of obese and only 20 % of non-obese subjects had increased difficulty of laryngeal exposure (VAS>2, n_o). 94.7 % of obese and 36 % of non-obese had a neck circumference greater than 40 cm. 36.6 % of obese versus 4 % non-obese patients had a Mallampati score of 3 or 4. Statistical analysis was performed. Correlations of BMI, Mallampati oropharyngeal status and neck circumference with VAS were calculated.

CONCLUSIONS: The correlation between oropharyngeal status, BMI and neck circumference were used to determine their predictive value in the obese patients. These criteria may help predict which patients pose a difficult laryngeal exposure. In such instances, laryngologists can utilize longer laryngoscopes, anterior laryngeal pressure and alert their collaborating anesthesiologists to potential airway problems in the operating room.

4:02 PM

Thursday, 26 April 2007

**Endoscopic Management of Zenker's Diverticulum:
Factors Predictive of Success or Failure**

Ann Marie B. Visosky, MD*
Robert B. Parke, MD, MBA.*
Donald T. Donovan, MD
Houston, TX

OBJECTIVE: To review our experience with endoscopic management of Zenker's diverticulum. We sought to analyze and determine risk factors for success or failure of endoscopic diverticulum treatment.

METHODS: Retrospective review of 72 consecutive patients who underwent attempted endoscopic management of a Zenker's diverticulum between January 2000 and April 2006. The procedures were performed by either of 2 otolaryngologists. There were 50 men and 22 women ranging in age from 44 to 93. A total of 85 procedures were performed. The medical records were reviewed for pre-operative diverticulum size (small-2 cm, moderate.1-3.0 cm and large 3.0 cm), intra-operative diverticulum characteristics, patient anatomical limitations which prevented adequate endoscopic visualization, surgical complications and management of recurrences.

RESULTS: 61/72 (85%) of our patient population were able to undergo endoscopic cricopharyngeal myotomy with diverticulum elimination. 47/61 (77%) of the endoscopic procedures resulted in complete symptom resolution. The most common risk factor for recurrence was diverticulum size (>3cm) and amount of redundant mucosa. Of those with a recurrence, 10/14 (71%) underwent a repeat procedure. 6/14 (43%) had a successful excision via a cervical approach and 4/14 (29%) underwent a repeat endoscopic myotomy. There was one major complication (esophageal tear) and 3 minor complications (mucosal abrasions).

CONCLUSIONS: Most patients with a Zenker's diverticulum are good candidates for endoscopic management. In our series, 84% of those who underwent endoscopic treatment ultimately achieved relief of symptoms. Patient morbidity is minimal. A large diverticulum with redundant mucosa is a risk factor for recurrence after endoscopic treatment.

DISCUSSION

4:15 PM

Thursday, 26 April 2007

**PANEL I: HOW THE EXPERTS CODE
AND DOCUMENT LARYNGOLOGY AND
ESOPHAGOLOGY IN THE OFFICE**

Moderator: **Michael Setzen, MD**
Manhasset, NY

Participants:

Jonathan Aviv, MD
New York, NY

Clark Rosen, MD
Pittsburgh, PA

Barbara J. Cobuzzi, MBA, CPC*
Tinton Falls, NJ

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

5:00 PM

Thursday, 26 April 2007

ADJOURN

7:00 AM

Friday, 27 April 2007

**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

**RECOGNITION OF
CHEVALIER JACKSON AWARD RECIPIENTS
1959-2007**

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
1999	Haskins Kashima, MD
2000	Eiji Yanagisawa, MD
2001	William W. Montgomery, MD
2002	Jack L. Gluckman, MD
2003	Ellen M. Friedman, M.D.

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2004 Robin T. Cotton, M.D.
2005 Charles W. Vaughn, MD
2006 Andrew Blitzer, MD, DDS
2007 Gayle E. Woodson, MD

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

8:00 AM

Friday, 27 April 2007

CHEVALIER JACKSON AWARD

Presenter: Gady Har-El, MD

Recipient:

GAYLE E. WOODSON, MD

Springfield, IL

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

Thursday, 26 April 2007

**SESSION IV: IN THE LAB:
FROM MICE TO MEN**

Moderator: Andrew Blitzer, MD, DDS
New York, NY

8:03 AM

Friday, 27 April 2007

**Air Cooling Reduces Thermal Damage During
Thulium Laser Dissection of Laryngeal Tissue:
An Ex-vivo Calf Model Study**

James Burns, MD

James B. Kobler, PhD*

James T. Heaton, PhD*

William A. Farinelli, PhD*

R. Rox Anderson, MD*

Steven M. Zeitels, MD

Boston, MA

Local air cooling during laser surgery is well established in dermatology for reducing soft-tissue thermal damage; however, this strategy has not been applied previously to endolaryngeal surgery. The 2 μ m wavelength thulium laser has recently been shown to be an effective cutting instrument in endolaryngeal surgery although there is increased thermal trauma compared with the carbon dioxide laser. This study investigated temperature changes and thermal trauma during thulium laser dissection of laryngeal tissue, with and without air cooling in an ex-vivo model. A continuous-wave thulium laser (400 μ m fiber, 4 Watts continuous power, 4 second duration) was used to incise 10 calf vocal folds. Paired cooled and un-cooled cuts were made in each fold, using a dermatological cooling device. A thermistor was used to measure tissue and smoke plume temperatures. Thermal damage was estimated by measuring the depth of the zone of lactate dehydrogenase inactivation surrounding the mucosal incision.

Initial vocal fold temperature averaged 24.3oC without cooling and 4.4oC with cooling. Peak temperature during cutting averaged 59.1oC without cooling and 28.0oC with cooling. The thermal damage zone surrounding the cooled incisions was 49% less deep than the un-cooled incisions on the average. Air cooling also effectively eliminated the high-temperature plume generated during laser cutting.

Air cooling can reduce the extent of thermal trauma associated with thulium laser surgery of the vocal folds by half. Air cooling also eliminates the high-temperature plume, which may scald nearby tissues when operating within the confined space typical of a laryngoscope speculum.

8:09 AM

Friday, 27 April 2007

**Neuromuscular Specializations within Human
Pharyngeal Constrictor Muscles**

Liancai Mu, MD, PhD*

Ira Sanders, MD

New York, NY

PURPOSE: This study tested the hypothesis that the adult human pharyngeal constrictor muscles (PCs) are divided into two distinct and specialized layers: a slow inner layer (SIL) innervated by the glossopharyngeal (IX) nerve and a fast outer layer (FOL) innervated by the vagus (X) nerve.

Materials and Methods: Eight normal adult human pharynges (16 sides) were studied to determine the motor contribution of the IX nerve to the PCs using Sihler's stain, acetylcholinesterase (AChE) and silver stain. The specialized muscle fibers in the PCs were recognized by myosin heavy chain (MHC) expression using immunocytochemical and immunoblotting techniques. In addition, the specialized nature of the two PC layers was also studied in developmental (newborn, neonate and senescent humans), pathological [adult humans with idiopathic Parkinson's disease (IPD)], and comparative [non-human primate (adult macaque monkey)] specimens.

RESULTS: By tracing IX and X nerves from their cranial roots to their intramuscular termination in Sihler's stained specimens, it was seen that the IX nerve supplied the SIL, whereas branches of the X nerve innervated the FOL in the adult human PCs. AChE and silver stain confirmed that the IX nerve branches supplying the SIL contained motor axons and terminated motor endplates. In addition to distinct motor innervation, the SIL muscle fibers contained the rare MHC-ton and MHC-á isoforms, whereas the developmental MHC-containing fibers were noted primarily in the FOL. In contrast, the FOL became obscured in the elderly and in the adult humans with IPD because of an increased proportion of slow muscle fibers. Notably, distinct muscle fiber layers were not found in the human neonate and non-human primate (monkey), but identified in the human 2 years old.

CONCLUSIONS: Human PCs appear to be organized into functional fiber layers as indicated by distinct motor innervation and specialized muscle fibers. The SIL appears to be a specialized layer unique to normal humans. The presence of the highly specialized MHC-ton and MHC-á isoforms, and their absence in other mammals and human newborn suggest that the specialization of the SIL may be related to speech. In contrast, the FOL is adapted for rapid movement as seen during swallowing. Senescent humans and patients with IPD are known to be susceptible to dysphagia, and this may be related to the observed shift in muscle fiber content.

8:15 AM

Friday, 27 April 2007

**Histopathologic Investigations of the Unphonated
Human Vocal Fold Mucosa**

Kiminori Sato, MD, PhD

Tadashi Nakashima, MD

Kurume, Japan

Satoshi Nonaka, MD*

Yasuaki Harabuchi, MD*

Asahikawa, Japan

In our previous studies the stellate cells (SCs) in the human maculae flavae (MF) located at both ends of the human vocal fold mucosa are postulated to be involved in the metabolism of extracellular matrices (EMs). And MF are considered to be an important structure in the growth and development of the human vocal fold mucosa. We also presume that the tractions caused by phonation (vocal fold vibration) stimulate SCs to accelerate production of EMs. If our hypothesis is supported, some morphologic differences can be detected between normal and unphonated adult vocal fold mucosa after adolescence.

Vocal fold mucosae, which were unphonated since birth, of 3 younger adults (17, 24, 28 years old) with cerebral palsy were investigated by light and electron microscopy.

In all cases, vocal fold mucosae (including MF) were atrophic. The vocal fold mucosa did not have a vocal ligament, Reinke's space nor a layered structure, and the lamina propria appeared as a uniform structure. SCs in the MF showed degenerations and not so many vesicles were present at the periphery of the cytoplasm. Cytoplasmic processes of the SCs were short and shrinking. The SCs synthesized fewer EMs, such as fibrous protein and glycosaminoglycan. The SCs appeared to decrease their level of activity.

This study supports our hypothesis that the phonation (vocal fold vibration) after birth stimulates SCs in the MF to accelerate production of EMs. Vocal fold vibration is one of the important factors in the growth and development of the human vocal fold mucosa.

8:21 AM

Friday, 27 April 2007

**A Cell Marker Specific to Stellate Cells of the Vocal
Fold Macula Flava**

Tomoko Tateya, MD*
Ichiro Tateya, MD, PhD*
Kyoto, Japan
Diane M. Bless, PhD*
Madison, WI

Vocal fold stellate cells are found in the macula flava of human and rat vocal folds. They are known to have several processes and a relatively large cytoplasm with lipid droplets containing vitamin A. Histological analysis has suggested that stellate cells may play a role in extracellular matrix production, however this has not been proven and so their function remains unclear. A marker specific to the stellate cell is needed to facilitate straightforward cell sorting and promote further research on this important vocal fold cell type. The purpose of this study was to determine if there is a cell marker specific to stellate cells of the vocal fold macula flava. Four normal human larynges and nine normal rat larynges were used in this study. The humans were all aged under 65, and the rats were in three age groups: 3-days-old, 3-weeks-old, or 8-months-old, with three rats per group. Vocal folds were analyzed using immunohistochemistry for vimentin, GFAP (glial fibrillary acidic protein), alpha-SMA (smooth muscle actin) and S-100. Among these cell markers, GFAP was specifically expressed in the stellate cells of vocal fold macula flava in humans, 3-week-old rats and 8-month-old rats. There was no expression of GFAP in 3-day-old rat vocal folds of which stellate cells are known to be immature. These results suggest that GFAP is a specific marker for mature stellate cells in human and rat vocal fold macula flava

8:27 AM

Friday, 27 April 2007

**The Chick Chorioallantoic Membrane (CAM) As a
Research and Microsurgical Training Model
Stimulating Human Vocal Fold Microvasculature**

James Burns, MD, FACS

Matthew Broadhurst, MD, FRACS*

James Kobler, PhD*

Lee Akst, MD *

Rox Anderson, MD *

Steven Zeitels, MD, FACS

Boston, Massachusetts

Evolving photoangiolytic laser techniques for treating vocal-fold lesions motivated the development of a model for research and surgical training. The chick chorioallantoic membrane (CAM), which is comprised of a microvasculature suspended within the egg albumen, resembles the vocal fold microcirculation within the superficial lamina propria (SLP). To better characterize this model, measurements of vessel diameters were made and compared to superficial vessels in human vocal folds.

The diameters of first, second, and third order CAM vessels were measured in 48 fertilized chicken eggs. Superficial blood vessels of the human vocal fold were measured in 5 subjects from intra-operative images.

Based on the vessel branching pattern, vessel segments were identified as being first, second, or third order with average diameters of 0.035mm (0.02 - 0.1mm), 0.18mm (0.12 - 0.41mm) and 0.8mm (0.6mm - 0.98mm) respectively. Total vessels measured included 362 1st order, 119 2nd order and 82 3rd order vessels. In 10 adult human vocal folds, an average vessel diameter of .04mm (0.015 - 0.1mm) was observed in 50 vessels.

The CAM microvasculature suspended in albumen provides a suitable surgical model resembling the microcirculation within the SLP of the human vocal fold. Although first-order CAM vessels best approximate the size of normal vocal-fold subepithelial vessels seen at surgery, second and third order vessels resemble vascular abnormalities frequently encountered during microsurgery for phonotraumatic lesions.

8:33 AM

Friday, 27 April 2007

DISCUSSION

STEVEN D. GRAY RESIDENT AWARD

Presented by Gady Har-El, MD

Tsunehisa Ohno, MD*

**Hepatocyte Growth Factor Drug Delivery System
for the Treatment of Vocal Fold Scarring in a
Canine Model**

Tsunehisa Ohno, MD*

Shigeru Hirano, MD

Shin-ichi Kanemaru, MD*

Yoshihiro Tamura, MD*

Masaru Yamashita, MD*

Hiroo Umeda, MD*

Atsushi Suehiro, MD*

Tatsuo Nakamura, MD*

Juichi Ito, MD*

Kyoto, Japan

Vocal fold scarring remains a therapeutic challenge. We have found that hepatocyte growth factor (HGF), a strong antifibrotic element, has a therapeutic potential in restoration of scarred vocal fold. To enhance the effect of HGF in vivo, we have developed a drug delivery system (DDS) of HGF in which HGF is embedded in gelatin hydrogel and gradually released from the gel in vivo over 2 weeks. The present study aimed to investigate the therapeutic efficacy of HGF-DDS in the treatment of vocal fold scarring using canine model.

Each animal's vocal fold was scarred unilaterally by stripping the whole layer of the lamina propria. The contralateral side was kept intact as a normal control. One month later, HGF hydrogel containing 1 μ g of HGF was injected into the scarred vocal folds in 4 dogs (HGF group), while saline was injected in other 4 dogs (sham control).

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Histological and vibratory examinations were completed for each group at 6 months after initial surgery.

Excised larynx experiments showed significantly better vibration in HGF-treated vocal folds, as compared to sham group, with normal or near to normal phonation threshold pressure. Histological evaluations indicated remarkable reduction of collagen deposition and tissue contraction with a good restoration of hyaluronic acid in HGF group.

It is suggested that HGF-DDS may have considerable effects in the treatment of vocal fold scarring.

**The Behavior of the Autologous Bone Marrow
Derived Stromal Cells Implanted in the Vocal Fold
on Healing Process**

Shin-ichi Kanemaru, MD, PhD*

Tatsuo Nakamura, MD, PhD*

Masaru Yamashita, MD*

Hiroo Umeda, MD*

Oono Tsunehisa, MD*

Shigeru Hirano, MD, PhD*

Juichi Ito MD, PhD*

Kyoto, Japan

Koichi Omori MD, PhD

Fukushima, Japan

OBJECTIVES: To investigate the behavior of implanted autologous bone marrow derived stromal cells (BSCs) containing mesenchymal stem cells (MSCs) in an injured vocal fold on healing processes. MSCs are pluripotent cells that have the potential to differentiate into cells of different lineages. We previously reported successful regeneration of an injured vocal fold in a canine model by implantation of BSCs and clarified the fate of the implanted BSCs. The behavior of implanted BSCs on healing processes has been unknown yet. Therefore, it is an important issue to trace implanted BSCs for the cell therapy in the future.

MATERIALS AND METHODS: After harvesting bone marrow from the femora of canine, adherent cells were cultured and selectively amplified. Bromodeoxyuridine (BrdU)-labeled BSCs and Green fluorescent protein (GFP)-transferred BSCs by Lentivirus were implanted into canine's injured vocal folds, respectively. In order to trace these cells, immunohistologic examinations of the resected vocal folds were performed. Though BrdU can be incorporated into the newly synthesized DNA of replicating cells, it cannot be identified during implanted BrdU-labeled cells repeat proliferation.

RESULTS: BrdU-positive BSCs were observed at even 2 weeks after implantation. Implanted GFP-transferred BSCs cells showed positive expression for keratin and desmin, which are markers for epithelial tissue and muscle, respectively.

CONCLUSION: There are possibilities that implanted BSCs don't proliferate themselves but differentiate into more than one tissue type in vivo. On healing process, implanted BSCs may work on the host tissue through the actions of paracrine and/or autocrine in addition to above direct actions.

8:53 AM

Friday, 27 April 2007

Age-Related Changes in the Murine Vocal Fold: A Model for the Aged Larynx

Oswaldo Henriquez, MD*

Wael M Abdelkafy, MD*

Johnathon Q Smith, BA*

Justin S Golub, BA*

Jianguo Xu, PhD*

Mauricio Rojas, MD*

Kenneth L Brigham, MD*

Micheal M Johns, MD

Atlanta, GA

INTRODUCTION: Changes in voice are commonly associated with aging (presbyphonia). Age-related voice change significantly impairs elderly individuals' ability to communicate meaningfully with others and affect their quality of life. With changing age demographics in our society and increasing emphasis on quality of life, treatment of presbylaryngis is becoming more paramount.

OBJECTIVE: To validate a mouse model for the aging larynx.

METHODS: 8 aged and 8 young mice were used to validate the animal model. The larynges were stained with alcian blue to determine the hyaluronic acid content, trichrome staining to determine the collagen content, and immunohistochemical staining for alpha smooth muscle actin to determine myofibroblast content. Morphometric measurements were performed for muscle area, muscle thickness, and muscle fiber diameter. Myoblast growth and differentiation patterns were studied through cell culture.

RESULTS: Statistically significant differences in the density measurements of hyaluronic acid and collagen reflected decreased hyaluronic acid and increased collagen content in the aging larynx. Alpha smooth muscle actin labeled myofibroblasts were seen only in the aged larynges. No statistically significant differences were found in the morphometric measurements although differences were found in myoblast growth and differentiation patterns.

CONCLUSION: Aged mice may make a good model for the age related changes in the vocal folds which can be used further in studies aiming to correct these changes.

**The Response of Cricopharyngeus Muscle to
Esophageal Stimulation by Mechanical Distention,
Acid and Bile Perfusion**

Clarence T. Sasaki, MD

Jagdeep Hundal, MD*

New Haven, CT

Ziwei Yu, MD*

*Shanghai, PR China**

Jiajun Xu, MD*

Shandong Province, PR China

PURPOSE: Failure of cricopharyngeus muscle (CPM) relaxation has been implicated in the clinical development of dysphagia, globus sensation, and the initiation of hypopharyngeal pulsion diverticuli. Causes for failed CPM relaxation are debatable. One such theory invokes the association between gastroesophageal reflux and CPM although the relationship remains unclear.

METHODS: Using a porcine model, we compared the electromyographic (EMG) response of CPM to esophageal 20ml balloon distention delivered by intraluminal catheterization to the proximal/mid/distal esophagus. Each site was also separately stimulated by intraluminal perfusion of 40ml 0.1 N HCl at a rate of 40ml per minute, taurocholic acid at pH 1.5 and chenodeoxycholic acid at pH 7.4.

RESULTS: EMG spike density before and after stimulation increased significantly due to proximal distention p01. Mid and distal esophagus appeared statistically insensitive p12 and 0.298 respectively. With acid perfusion, spike density increased over baseline at proximal esophagus p0001 and the distal esophagus p03 while the mid esophagus continued to remain insensitive p11. Stimulation with bile components produced no significant increase at any level: proximal p10, mid p25, distal p25.

CONCLUSIONS: Proximal esophageal distention along with acid challenge proximally and distally appeared important mechanisms in generation of CPM "spasm".

DISCUSSION

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Friday, 27 April 2007

**SESSION V: INNOVATIVE DRUGS AND
DEVICES**

Moderator: Milan Amin, MD
New York, NY

**Dexmedetomidine Sedation for Laryngeal
Framework Surgery**

Nicole Maronian, MD

Cleveland, OH

Ryan J. Jense, MD*

Karen Souter, MB BS, FRCA*

Jo Davies, MB BS, FRCA*

Seattle, WA

Christopher Romig, MD*

Atlanta, GA

PURPOSE: Performing awake laryngeal framework surgery mandates a delicate balance between patient comfort versus airway collapse with over sedation. We evaluated if dexmedetomidine could safely and effectively be used as the sole intravenous anesthetic agent in conjunction with local anesthesia to limit airway collapsibility, over sedation effects, and poor patient participation with phonatory testing.

STUDY DESIGN: Prospective evaluation of fourteen patients who underwent laryngeal framework surgery with dexmedetomidine anesthesia from 2004 – 2005.

Methods: All dexmedetomidine doses, sedation levels and vital signs were recorded throughout the duration of the procedures. Operative conditions, including still and video image capture, were noted by the surgeon in terms of airway visibility and patient ability to participate in phonatory testing.

RESULTS: In 100% of the patients, dexmedetomidine sedation produced hemodynamic and respiratory values that were maintained at near pre-operative values. Utilizing the Observer's Assessment of Alertness-Sedation (OAA/S) score the patients distributed as follows: Level 5 (34%), Level 4 (50%), Level 3 (16%) with overall excellent patient tolerance and comfort. Further, maintenance of overall pharyngeal-laryngeal integrity provided excellent surgical visualization, far superior to the previous standards of propofol/fentanyl.

CONCLUSION: We believe that dexmedetomidine provides excellent sedative and operative conditions for laryngeal framework procedures. Coupled with local anesthesia, dexmedetomidine produced virtually no undesirable hemodynamic or respiratory effects while allowing for adequate sedation and patient comfort. Operative conditions were found to be excellent, with a marked improvement over standard sedating protocols for laryngeal procedures requiring patient participation.

Dexmedetomidine should be considered the gold standard for laryngeal framework surgery and other awake otolaryngologic procedure.

9:18 AM

Friday, 27 April 2007

**Utilization of the Lifestat Emergency Airway
Device: A Cross Sectional Survey**

Debbie Aviva Mouadeb, MD*

Catherine Rees MD*

Peter C. Belafsky MD, PhD

Sacramento, California

BACKGROUND: Management of the emergency airway is a harrowing experience. The equipment necessary to perform this procedure is often inaccessible. The Lifestat airway is a portable device approved by the Food and Drug Administration in 1997 for emergency cricothyrotomy. It is small enough to secure to a keychain, thus allowing instantaneous access at all times.

Objective: To report the experience of clinicians who have utilized the Lifestat device for performing emergency cricothyrotomy.

STUDY DESIGN: Cross sectional survey.

METHODS: A survey instrument was sent to a convenience sample of health care professionals that purchased the Lifestat emergency airway. The survey queried device utilization, user demographics, success, ease, and location of use.

RESULTS: One thousand surveys were distributed and 100 individuals responded. Fifteen percent (15/100) reported use of the device on 17 occasions. The Lifestat was used successful in 100% (17/17). Eighty-two percent (14/17) of emergency use was in the hospital setting [operating room (4/17), emergency room (3/17), ward (3/17), recovery room (2/17), and intensive care unit (2/17)]. Outside of the hospital the device was used at a birthday party (1/17), on a fishing boat (1/17) and at a religious service (1/17). In all cases the device was positioned successfully on the first attempt. No complications were reported. Clinicians who used the device were Otolaryngologists (6/15), General Surgeons (4/15), Anesthesiologists (3/15), a nurse anesthetist (1/15), and an Emergency Room Physician (1/15).

CONCLUSIONS: The Lifestat device provides a safe and effective means of performing emergency cricothyrotomy by clinicians of various specialties. The majority of emergency airways where the device was deployed occurred in the hospital setting.

**New Device for Home Screening of Obstructive
Sleep Apnea Using Holter Oximetry**

Jordan C. Stern, MD*

John Tseng*

Scott Gold, MD*

Robert Pincus, MD

New York, NY

PURPOSE: This report describes the use of two new devices used to screen for obstructive sleep apnea (OSA). Holter apnea monitoring and holter oximetry were used on patients in the home setting to rule out OSA. We describe patients' impressions of their testing experience as well as the reliability of the testing devices.

METHOD: The new device produces an apnea hypopnea index (AHI) based on an automated processing method of a continuous electrocardiogram with or without oximetry. Past publications have shown that this method can distinguish normal from significant apnea recordings in 100% of cases. The results of this report are based on a brief questionnaire filled out by 23 patients tested at home with one of the two devices. The reliability of the devices was determined by the number of tests completed without interruption due to electrode or device failure.

RESULTS: 19 adults and 4 children (ages thirteen and under) were tested. The Holter apnea monitor was used on 13 adult patients and the Holter oximeter on 6 adults and 4 children. Because this new OSA screening device requires only the application of chest surface electrodes with or without a finger oximeter, patient acceptance was 100% and useable data was 94%. One patient had to repeat the test because of a failed oximetry lead during the night.

CONCLUSION: This new method of OSA estimation is based on an automatic mathematical evaluation of recorded data and represents a simple cost effective way to screen for OSA in the home setting. Its ease of use makes it one of the first objective home screening devices that can be used in adults and children.

9:28 AM

Friday, 27 April 2007

**Current State of Robotic Scanning Applications
with the CO2 Laser**

Marc Remacle, MD, PhD

Georges Lawson, MD*

Monique Delos, MD*

Jacques Jamart, MD*

Yvoir Belgium

PURPOSE OF THE STUDY: The development of the automatic scanning system has considerably enhanced CO2 laser energy delivery, improving cutting and ablation modes. We have conducted a study in order to know if there are any differences between SuperPulse and UltraPulse lasing applications (both compatible with the scanning system) with regard to thermal diffusion into the surrounding tissues, healing time and clinical results.

METHOD OF STUDY: Fifteen patients with bilateral and similar vocal fold lesions (5 Reinke's edema, 4 nodules, 2 papillomatoses, 2 bilateral epidermoid cyst, 1 granuloma, 1 keratosis) have been operated, one side in SuperPulse mode and the other side in UltraPulse mode. The automatic parameters for phonosurgery have been: depth of 0.2 mm, 10Watt, single pulse, 0.10 sec for SuperPulse; 2 passes, 10Watt, single pulse, 0.10 sec for UltraPulse. Quality of healing and vocal fold vibration were observed after 8-10 days and coagulation along the incision line was measured.

RESULTS: Incisions are sharper with UltraPulse (demonstrated on videoclips), making the surgery easier but at the first postoperative control no differences were observed in the presentation, the healing and the vibration of the 2 vocal folds. Median coagulation along the incision line is 25µm [20-30](IQR, Interquartile range) for SuperPulse and 15µm [15-20](IQR)for UltraPulse (p.02, Wilcoxon signed rank test)

CONCLUSION: In comparison with SuperPulse, the UltraPulse CO2 laser makes a procedure easier, but did not improve the clinical outcome.

**Comparison of High Speed Digital Imaging with
Stroboscopy for Laryngeal Imaging of Glottic
Pathology**

Rita R. Patel, MD (SLP)*

Seth H. Dailey, MD

Diane M. Bless, PhD (SLP)*

Madison, Wisconsin

High speed digital imaging (HSDI) unlike stroboscopy is a frequency independent visualization technique that provides detailed biomechanical assessment of the vocal physiology because of increased temporal resolution of 4000 frames per second (fps) compared to 30fps on stroboscopy. The purpose of this study was to investigate the clinical value of HSDI compared to stroboscopy across three pathology groups classified as either disorders of epithelium, subepithelium or neurologic based on the Body-Cover theory of phonation (Hirano, 1981). Data from 252 participants (female 56, male 6) was subjected to comparison of vibratory feature analysis from HSDI and stroboscopy. Judgments of vibratory features of vocal fold edge, glottal closure, phase closure, vertical level approximation, vibratory amplitude, mucosal wave, phase symmetry, tissue pliability, and glottal cycle periodicity were performed by three experienced raters after training. Results revealed that 63% of participants could not be analyzed on stroboscopy because of the severity of the voice disorder (100% with severe voice disorder and 64% with moderate voice disorder) that resulted in tracking errors, whereas HSDI resulted in analysis of 100 % of the data. The neuromuscular group (74%) was most difficult to analyze with stroboscopy followed by the epithelial (58%) and subepithelial groups (53%). Patients with values exceeding 0.87% jitter, 4.4% shimmer and signal to noise ratio of over 29.7dB on acoustic analysis should serve as indications for use of HSDI. In conclusion HSDI can be viewed as augmentative to stroboscopy, particularly in cases with moderate-severe aperiodicities where HSDI may aid clinical decision making.

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9:38 PM

Friday, 27 April 2007

THE SEYMOUR COHEN AWARD

Presenter: Gady Har-El, MD

Recipient:

JAMES M. RIDGWAY, MD *

**OPTICAL COHERENCE TOMOGRAPHY OF
THE NEWBORN AIRWAY**

Ryan Wright, BS*

James M. Ridgeway, MD*

Jianping Su, BS*

Shuguang Guo, PhD*

Jorge Perez, MS*

Ali Sephr, MD*

Gurpreet S. Ahuja, MD*

Roberto Barretto, MD*

Zhongping Chen, PhD*

Brian J-f Wong, MD, PhD*

Irvine, CA

OBJECTIVES: Acquired subglottic stenosis of the newborn is often associated with prolonged endotracheal intubation. This condition is generally diagnosed during operative endoscopy after airway injury has occurred. Unfortunately, endoscopy is unable to characterize the submucosal changes responsible for airway compromise. Other imaging modalities such as MRI, CT and ultrasound do not possess the necessary level of resolution to differentiate scar, neocartilage, and edema. Optical Coherence Tomography (OCT) is an imaging modality that produces high-resolution, cross-sectional images of living tissue (8-20 μ m). We examined the ability of this modality to characterize the

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newborn airway in intubated and non-intubated patients.

MATERIALS AND METHODS: Ten newborn patients requiring ventilatory support underwent airway imaging. OCT was performed using a 1.6 mm fiber and a 1.3 mm broadband light source at a frame rate of 1 Hz to produce images 1.6 mm x 6 mm in dimension. Airway epithelium, lamina propria, cartilage, and unique tissue microstructures were clearly imaged and measured. Comparative analysis of intubated and non-intubated states was performed.

RESULTS: Imaging of the supraglottis, glottis, subglottis, and trachea was performed in all 10 patients revealing unique tissue characteristics as related to turbidity, signal backscattering, and architecture. Structures identified included the true and false vocal folds, ventricles, cricoid, thyroid shield, tracheal rings, ducts, glands, and vessels.

CONCLUSIONS: OCT clearly identifies in vivo tissue layers and regional architecture while offering detailed information concerning tissue microstructures. The diagnostic potential of this technology makes OCT a promising modality in the study and surveillance of the neonatal airway.

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Friday, 27 April 2007

DISCUSSION

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

9:50 AM

Friday, 27 April 2007

BREAK WITH EXHIBITORS

10:15 AM

Friday, 27 April 2007

**PRESIDENTIAL CITATION FOR FOREIGN BODY
MANAGEMENT**

Presented by Gady Har-El, MD

**Endoscopic Management of a Chronic Esophageal
Foreign Body**

Aaron D. Friedman, MD*

Keiko Hirose, MD*

Cleveland, OH

Peter J. Koltai, MD

Palo Alto, CA

PURPOSE: To detail the endoscopic operative management and post-operative sequelae of a chronic esophageal foreign body.

STUDY DESIGN: Case report.

RESULTS: A three year old boy presented with a three month history of intermittent emesis and dysphagia. Barium swallow and CT scan of the neck demonstrated a coin in the proximal esophagus and a 2 x 2 cm fluid collection anterolateral to it. The patient underwent microlaryngoscopy, rigid bronchoscopy, and rigid esophagoscopy in the operating room. An esophageal diverticulum was present, just proximal to the coin. The foreign body was lodged in the anterior esophageal wall, and removal produced a rush of purulent fluid.

No obvious rent in the esophagus was seen. Post-operatively, the child was started on a regular diet after another swallow study confirmed absence of a leak. He was placed on prophylactic antibiotics, but did not develop infectious complications. He had recurrence of dysphagia two and then four months later requiring flexible esophagoscopy and dilation of an esophageal stricture on two occasions. Since then the patient has been tolerating food without incident.

CONCLUSION: Successful endoscopic management of a chronic esophageal foreign body can be achieved but there must be a high level of suspicion for an associated diverticulum and/or stricture.

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**SESSION VI: LESSONS IN THE
PEDIATRIC AIRWAY**

Moderator: J. Scott McMurray, MD
Madison, WI

10:22 AM

Friday, 27 April 2007

**Cricotracheal Resection in Children Younger than
Two Years Old**

Romaine F. Johnson, MD*

Mike Rutter, MD, FRACS

Robin Cotton, MD

Cincinnati, Ohio

David White, MD*

Charleston, South Carolina

Shyan Vijayasekeran, FRACS*

Perth, Australia

BACKGROUND: Cricotracheal resection (CTR) is an effective surgical means of treating subglottic stenosis in children. Few studies have examined CTR's outcomes in very young children.

PURPOSE OF STUDY: To examine the surgical outcomes of cricotracheal resection in children 2 years of age and younger.

STUDY DESIGN: Retrospective case series involving a single tertiary care Children's Hospital. All patients who underwent cricotracheal resection from 1993 through 2005 were included. Patients 2 years old and younger were compared to all children 3 - 18 years of age. Primary outcomes measured were overall decannulation and complications rates. Chi squared analysis was done for categorical variables to detect differences in proportions and student t-tests were used for continuous data. Significance was set at p .05.

RESULTS: 15 children aged 2 years of age or younger were identified. The majority presented with a Cotton-Myer grade 3 or 4 subglottic stenosis. Most patients underwent a single-staged operation (n_). The decannulation rate for single-staged CTR was 100% in children younger than two. The overall decannulation rate was 87% (2 failures). Two patients younger than 2 years had postoperative complications including one patient who developed anastomosis dehiscence. When compared to the patients over two, patients younger than two were more likely to undergo a single stage procedure (p <0.01) and be decannulated (p<0.05). Complication rates were similar in both groups.

CONCLUSION: Cricotracheal resection can be performed safely and effectively in children less than 2 years old.

10:28 AM

Friday, 27 April 2007

Neonatal Upper Airway Obstruction in Osteogenesis Imperfecta: A Series of Three Cases and Review of the Literature

Kaalan Johnson, MD*

Melissa Pineda, MSIV*

Craig Derkay, MD, FACS

David Darrow, MD, DDS, FACS

Norfolk, VA

PURPOSE: Osteogenesis Imperfecta (OI) is a genetic disorder characterized by variable degrees of dysfunction in Type I collagen formation. It is caused by mutations in COL1A1 and COL1A2 genes which code for the procollagen chains α1 and α2 respectively, and manifests as a variety of phenotypes including blue sclerae, fractures, and hearing loss. Upper Airway Obstruction (UAO) is not a commonly considered association with OI.

METHODS: Retrospective chart review of three cases and review of the literature.

RESULTS: Three consecutive cases of OI at our institution required otolaryngologic evaluation. The first had the most mild mutation type and was free of airway concerns until developing severe reflux triggered laryngospasm which improved with Nissen and gastrostomy tube placement. He had mild hypotonia on endoscopy. The second case had severe OI and the greatest fracture burden at birth. He required tracheotomy after early respiratory failure, with some mild bronchomalacia noted. The third case was felt to have the most severe of the OI mutations and underwent C-section delivery. She lasted 2 months before developing respiratory failure requiring tracheotomy with mild tracheomalacia and glottic narrowing noted. Relevant literature is discussed regarding UAO or tracheotomy requirement and OI.

CONCLUSION: UAO consisted of mild hypotonia or malacia in three cases of consecutive OI, and may contribute to pulmonary and mechanical etiologies of tracheotomy requirement. Greatest predictors of tracheotomy requirement appear to be severity of OI mutation and fracture burden. Elective C-section should be considered in severe cases of OI.

10:34 AM

Friday, 27 April 2007

**Incidence of Vocal Cord Paralysis in Infants after
Ligation of Patent Ductus Arteriosus: Vascular Clip
versus Suture Ligature**

William C. Spanos, MD*

James Brookes, MD*

Mark Smith, MD*

Edward Bell, MD*

Harold Burkhart, MD*

Richard Smith, MD

Iowa City IA

PURPOSE: This study investigates risk factors associated with iatrogenic vocal fold paralysis (IVFP) in the context of patent ductus arteriosus (PDA) ligation and compares the rate of paralysis between vascular clip and suture ligation therapy.

DESIGN AND METHODS: A prospective examination of all patients with isolated PDA treated surgically during 1995 to 2005 was performed. Statistical significance was determined with a two tailed t-test.

RESULTS: Of 67 total PDA ligations, all cases of IVFP occurred in 55 infants less than 1 kg birth weight. Suture ligation was used in 60% versus vascular clips in 40% of all PDA ligation patients. Thirteen cases of IVFP were diagnosed with an overall incidence of 19%. The incidence of IVFP in patients with vascular clips (19%) was similar to the incidence with suture ligation (20%). Hoarseness or stridor was present in 69% of patients with IVFP compared to 17% of normal controls ($p < .001$). The rate of aspiration was not increased in the IVFP group; however, 27% of patients with IVFP had desaturations versus 14% of normal controls ($p < .05$).

CONCLUSIONS: A hoarse infant with a birth weight less than 1 kg status post PDA ligation should be examined for iatrogenic vocal cord paralysis. Vascular clips and suture ligation are associated with similar rates of IVFP.

10:40 AM

Friday, 27 April 2007

**Time Between Aspiration and Retrieval of Pediatric
Airway Foreign Bodies Does Not Affect Outcomes**

Matthew Lutch, MD*

Gurston Nyquist, MD*

Joshua Gottschall, MD*

Oakland, California

PURPOSE: The purpose of our study was to specifically evaluate the time between witnessed aspiration and retrieval of foreign bodies as a predictor of outcomes. Our hypothesis was that there was no difference in outcomes for foreign bodies removed emergently versus delayed urgent bronchoscopy.

DESIGN AND METHODS: This study was a retrospective chart review of 41 consecutive foreign body aspirations in patients under 18 years of age presenting to our institution over an 11 year period from 1995 to 2006. The time between witnessed aspiration event to bronchoscopic retrieval was recorded as well as intraoperative findings, postoperative complications and days in hospital.

SUMMARY: Time from aspiration to retrieval varied from 1 hour to 240 days. The average time from aspiration to retrieval was 17 days. There were no serious postoperative complications with the exception of a single patient who had asphyxiated due to hotdog aspiration and complete laryngotracheal obstruction. Witnessed aspiration was the single best positive predictor for presence of a foreign body. (66%)

CONCLUSION: Our study confirms that patients with any combination of history, physical or radiographic finding suggestive of foreign body aspiration mandates bronchoscopy. The best positive predictor was a witnessed aspiration episode. It is prudent to defer retrieval until optimal resources are available in select cases. This includes support staff familiar with the bronchoscopic apparatus as well as access to pediatric anesthesia and critical care specialists. This is the first study demonstrating no difference in outcome between patients who underwent emergent versus delayed urgent foreign body retrieval.

10:46 AM

Friday, 27 April 2007

DISCUSSION

Friday, 27 April 2007

**PANEL II: INSTITUTE OF
LARYNGOLOGY AND VOICE
RESTORATION PANEL DISCUSSION ON
NIGHTMARES IN THE PEDIATRIC
AIRWAY**

Moderator: Peter Koltai, MD, FACS
Stanford, CA

Participants:

Noel Garabadien, MD
Paris, France

Andy Inglis, MD
Seattle, WA

Dana Thompson, MD
Cincinnati, OH

Ian Jacobs, MD
Philadelphia, PA

11:55 AM

Friday, 27 April 2007

Introduction of New President

CLARENCE T. SASAKI, MD
New Haven, CT

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

12:00 PM

Friday, 27 April 2007

ADJOURN

12:15 PM

Friday, 27 April 2007

Annual Photograph of the Membership

THE AMERICAN BRONCHO-ESOPHAGOLOGICAL ASSOCIATION

***COMBINED
SCIENTIFIC POSTER SESSION***

**Manchester Grand Hyatt
San Diego, CA**

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ASSOCIATION**

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AMERICAN RHINOLOGIC ASSOCIATION

All ABEA, ALA, ARS, ANS, AOS 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 (85-117) of this program booklet.*

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**RULES CONCERNING THE PRESENTATION
OF PAPERS AT THE ANNUAL MEETING**

1. The reading of any paper shall not extend beyond the time allotted by the Program Committee. The exact time for presentation will be allotted by the Program Committee. This shall include presentation of slides, pictures, and video demonstrations.
2. Five complete copies of the paper and illustrations must be submitted prior to the presentation. If the presenter does not comply with this rule, the paper may not be given. Three copies of the manuscript should be directed to The Annals of Otology, Rhinology & Laryngology, 2 copies to Michael Rothschild, MD, Editor of the ABEA Transactions. For those seeking awards, 1 copy must be sent to Jonathan Aviv, MD of the Awards and Thesis Committee.
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5. Only original and unpublished papers may be submitted for consideration. The same or similar abstract should not be submitted simultaneously to any other meeting or publication.

**Hypopharyngeal Fish Bone Retrieval Using Tobald
Fauvel Forceps Attached to a Flexible Fiberoptic
Scope**

John B. Bitner MD, PhD*
Abraham J. Sorom, MD*
Jaspreet K. Dhaliwal, MD*
Laura J. Orvidas, MD*
Rochester, MN

Foreign bodies found in the hypopharynx, especially fish bones, are a not uncommonly encountered problem in the otolaryngologists practice. This area is particularly difficult to access due to poor visualization and a gag reflex with instrumentation. We present a case of a patient who presented to the Emergency Department with complaints of a foreign body sensation in her throat. She was found to have a fish bone in the piriform sinus, visible on flexible fiberoptic examination. She was in no airway distress. The foreign body was removed in the emergency department using a flexible fiberoptic scope affixed to a long, curved, vertically grasping instrument (Tobald-Fauvel 9 inch grasping forceps). This case demonstrates an easily accomplishable method to remove foreign bodies in a way that is safe and relatively well tolerated by an awake patient, using topical anesthesia only. The instruments required are already part of the otolaryngologist supply. The procedure is generally well tolerated in a patient that is cooperative and willing to tolerate some minor discomfort. It is our experience that most adolescents and adults are willing and able to undergo this procedure to avoid the inconvenience and risk of a general anesthetic.

Endoscopic Removal of Giant Fibrovascular Polyp of the Esophagus

Annette M. Pham, MD*
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INTRODUCTION: Giant fibrovascular polyps of the esophagus are rare benign tumors originating from the post-cricoid region. These pedunculated lesions can grow to “giant” proportions, reaching 10-20 cm in length. Asphyxiation from aspiration of the regurgitated polyp is a well-described cause of death. Traditionally, excision has required a transcervical approach with a vertical esophagotomy.

OBJECTIVE: To describe the successful endoscopic removal of a giant fibrovascular polyp of the esophagus.

STUDY DESIGN: Case report and literature review.

RESULTS: A 50-year old male with a short, obese neck and obstructive sleep apnea was referred for evaluation of an esophageal mass intermittently regurgitated into the hypopharynx. During emergence from a recent general anesthetic, the mass acted as an intermittent airway foreign body, partially obstructing the glottis. On office esophagoscopy, a 10-cm giant fibrovascular polyp originating just below the cricoid cartilage was visualized. Endoscopic removal was planned with the possibility of an external approach if necessary. The base of the lesion was exposed with a Weerda bivalved laryngoscope, and bipolar cautery was used to transect the base. There was excellent hemostasis, and a nasogastric feeding tube was placed. No esophageal leak was noted on an esophagram on post-operative day 3. He tolerated a liquid diet and was discharged home, resuming a soft diet within a week.

CONCLUSION: Giant fibrovascular polyps of the esophagus are life-threatening because of potential airway obstruction. This report describes successful endoscopic removal of a giant fibrovascular polyp, sparing the patient the risks and morbidity associated with a transcervical vertical esophagotomy.

**Indications and Oncologic Outcomes of
Cricotracheal Resection and Anastomosis (CTRA)
In a Series Of 30 Patients Affected by Tumors of the
Laryngotracheal Junction (LTJ)**

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CTRA is mostly applied to benign subglottic stenoses. Aim of this paper is to describe our experience in approaching by CTRA selected cases of LTJ tumors. Between 1996 and 2006, we performed CTRAs in 30 patients affected by LTJ tumors. Eleven were primary tumors (1 pleomorphic adenoma, 6 low-grade chondrosarcomas, 2 low-grade mucoepidermoid, 1 adenoid cystic, and 1 squamous cell carcinomas), 19 were tumors from adjacent sites involving the airway (10 well-differentiated and 3 dedifferentiated thyroid cancers, 3 thyroid metastasis from non-head and neck malignancies, and 3 metastatic recurrent lymph nodes from cancer of the UADT). All of them were submitted to CTRA involving only tracheal rings in 8 cases, the trachea and the cricoid arch in 12, the trachea, the arch and part of the cricoid plate in 10.

At last consultation (September 2006), all patients with primary LTJ tumors were free of disease (mean follow-up, 59 months; range, 7-121). Among patients with tumors arising from adjacent sites, 9 (47%) were free of disease (mean follow-up, 20 months; range, 5-46), 7 (37%) were alive with distant metastases (mean follow-up, 34 months; range, 1-85), 2 died for local-regional disease 12 and 2 months after surgery, and 1 died for distant metastases 32 months after CTRA. Complications occurred in 9 patients (30%) and required permanent tracheotomy in 1 patient and total laryngectomy in another.

CTRA is an organ preservation technique to be considered oncologically safe in selected LTJ tumors in which the endoscopic approach either failed or was thought unfeasible.

Why Did the Chicken-Bone Cross the Larynx? To Reach the Endoscope

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A 7 year old girl presented to a local emergency department with intermittent throat pain after swallowing a piece of chicken at dinner. After her dinner she continued to drink liquids without difficulty and was tolerating her own secretions. She later awakened from sleep with significant throat pain. There was no associated dyspnea, stridor, wheezing or cough. On physical examination she was in no acute distress with normal vital signs and no drooling.

A lateral neck x-ray revealed a round density at the level of the pyriform sinus posterior to the epiglottis. The PA film showed a thin linear density lying transversely across the larynx at C-3.

Fiberoptic flexible endoscopic exam via the oral cavity revealed a white linear foreign body in a transverse orientation posterior to the arytenoids, firmly lodged and spanning the inter-pyriform sinus region.

The patient was transferred to our Children's Hospital for definitive management.

Under general mask anesthesia, with the child spontaneously breathing, telescopic video-guidance was used to evaluate the laryngeal inlet, position of the foreign body and for delivery of topical anesthesia to the vocal cords. The chicken bone was removed with alligator forceps via direct laryngoscopy using a Parson's laryngoscope. It was disimpacted first from the left pyriform sinus, rotated and delivered out of the mouth. Her post-extraction laryngeal exam was normal and she was discharged from the PACU.

**PRESIDENTIAL CITATION FOR
FOREIGN BODY MANAGEMENT**

Presented by Gady Har-El, MD

To

Aaron D. Friedman, MD*

Keiko Hirose, MD*

Peter J. Koltai, MD, FACS, FAAP

Podium Presentation at 10:15 am

**Endoscopic Management of a Chronic
Esophageal Foreign Body**

**Complications of Stenting in the Treatment of
Upper Airway Stenosis**

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Laryngotracheal stenosis (LTS) can be a complex and challenging problem to manage. A variety of methods currently are employed to treat LTS, including stenting. The use of stents in the upper airway, however, can have significant complications in and of itself. Design: Case series. Summary: We report on the complications encountered in three patients treated for laryngotracheal stenosis with stenting. Patient 1 underwent dilation of subglottic and tracheal stenosis with subsequent placement of a Dumon stent. The stent migrated into the glottis and the patient required emergent awake tracheostomy and removal of the stent. Patient 2 underwent placement of a Wallstent for cervical tracheal stenosis. The patient subsequently developed a tracheoesophageal fistula with aspiration and required a thoracotomy and interposition flap to repair. Patient 3 underwent placement of a Palmaz stent for subglottic stenosis. The patient required emergent tracheotomy secondary to overgrowth of the stent with granulation tissue, which was only possible by cutting through the stent with wire cutters. Conclusions: All three patients presented with life-threatening complications. As the spectrum of physicians who treat airway stenosis increases, it is likely that patients with laryngotracheal stenosis may be offered stenting procedures in lieu of traditional laryngotracheoplasty, which can complicate the management of these patients when airway obstruction recurs. The use of stents for upper airway stenosis can be associated with significant morbidity. Otolaryngologists need to be aware of the potential complications and be prepared to handle them creatively.

**Impact of Androgen Therapy in a Singer
Undergoing Female to Male Gender Reassignment**

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Helena Yip, MD*
Yuling Yan, PhD*
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PURPOSE: To describe the timing of changes in fundamental frequency to the female voice following androgen therapy during female to male gender reassignment.

DESIGN: Retrospective study.

METHODS: A 32 year old female semi-professional singer undergoing gender reassignment and intramuscular androgen injections was examined at monthly intervals to monitor the impact of therapy on the voice. Laryngostroboscopy and acoustic analysis were performed simultaneously to monitor for potential laryngeal pathology.

RESULTS: The pretreatment mean fundamental frequency (MF0) was 228.45 Hz +/- 27.45 Hz. Pretreatment pitch ranged between 140.26 Hz to 430.64 Hz. Between months three and four of treatment, the patient experienced a sharp decline of the MF0 to 116.52 Hz +/- 27.45 Hz. Post treatment pitch ranged from 90.75 Hz to 201.07 Hz. Shimmer increased from 3.4% to a post treatment average of 7.8%. Noise to harmonics ratio also increased from a pretreatment average of 0.12 to 0.17 post treatment. The patient has continued to sing semi-professionally despite these changes in laryngeal function.

SUMMARY: Androgen therapy exerts a profound change on mean fundamental frequency between the third and fourth months of treatment. In addition, pitch range is reduced in a commensurate fashion. Patients undergoing androgen therapy should anticipate a significant change in speaking voice between the third and fourth months of therapy. Moreover, patients who sing can expect a reduction in pitch range, although this does not necessarily mean an end to singing ability.

**The Use of Calcium Hydroxylapatite to Alleviate
Aspiration in the Near-Total Laryngectomy Patient**

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Edward J. Damrose, MD
Stanford, CA

PURPOSE: Near-total laryngectomy is a surgical technique which grants the potential for postoperative speech without the need for prostheses or secondary surgical procedures. Aspiration can be a problem, however, that can require completion laryngectomy to resolve.

DESIGN: Case Report.

Summary: A 75 year old male underwent a near-total laryngectomy for recurrent laryngeal cancer. The patient developed chronic aspiration secondary to a leaking shunt. Work up was negative for recurrent cancer. Calcium hydroxylapatite was injected transorally at the opening into the shunt and transtomally into the exit of the shunt in order to seal it.

RESULTS: Postoperative barium swallow showed resolution of aspiration. At approximately one year, the patient developed recurrent intermittent aspiration of thin liquids and required reinjection of the shunt, with resolution of the aspiration.

CONCLUSIONS: Calcium hydroxylapatite allows simple and effective alleviation of aspiration following near-total laryngectomy but requires repeat injection to maintain efficacy. Injection of calcium hydroxylapatite can be an effective alternative to completion laryngectomy in patients who aspirate following near-total laryngectomy.

**Management of Fetal Airway Obstruction and the
Ex-utero Intrapartum Treatment (EXIT)
Procedure: An Otolaryngologic Perspective**

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BACKGROUND: Obstructive head and neck masses in the newborn patient present a difficult and potentially fatal clinical problem. Current antenatal imaging allows for early detection and exceptional detail of these anomalies while utilization of the EXIT procedure enables securing of the fetal airway while maintaining maternal-fetal circulation. Extensive planning is critical for successful outcomes.

METHODS: A retrospective review of six cases.

RESULTS: Potential airway obstruction was diagnosed antenatally by ultrasonography and MRI. Fetal anomalies included a massive cervicofacial cystic teratoma, oropharyngeal masses with and without syngnathia, brachial cleft cyst, and cystic hygroma. Extensive planning and coordination was performed by the pediatric otolaryngologist with a multidisciplinary team of perinatologists, maternal and neonatal anesthesiologists, neonatologists, extra-corporeal membrane oxygenation (ECMO) team, and respiratory therapists. Each member of the team was made cognizant of the details of potential events, potential adverse outcomes, and assigned a specific role in the procedure. Interventions ranging from diagnostic laryngoscopy and bronchoscopy to the performance of a tracheotomy while on fetomaternal support were performed in this series. In all six cases, coordination and timing proved to be crucial in successful performance of the EXIT procedure.

CONCLUSIONS: The EXIT procedure can be used as an effective form of airway management in neonates with antenatally detected head and neck masses suspected of causing airway obstruction. A team approach is paramount to successful outcome. The pediatric otolaryngologist must oversee multi-disciplinary planning, assign responsibilities, predict contingencies, and lead the peripartal management when timing is crucial.

**Cost Savings Analysis of In-office Transnasal
Esophagoscopy**

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OBJECTIVE: Transnasal esophagoscopy (TNE) is an effective and well tolerated diagnostic tool used to visualize the upper aerodigestive tract. TNE is an alternative to traditional esophagoscopy performed under sedation and can be used to diagnosis various esophageal pathologies such as Barrett's esophagus and to biopsy tumors. The objective of this study was to determine the cost savings derived by performing TNE in the office compared to the identical procedure performed under intravenous sedation in the endoscopy suite.

METHODS: Retrospective cost identification analysis was performed using the CPT code 43200. Billing records of patients who underwent TNE in the Otolaryngology-Head and Neck Surgery Department were compared to patients who underwent esophagoscopy in the endoscopy suite through the Division of Gastroenterology.

RESULTS: Sedated esophagoscopy required preprocedure placement of intravenous lines (\$70.00 charge versus \$0.00 for TNE), fentanyl and versed for sedation (\$25.00 charge versus \$0.00 for TNE), procedure time, postprocedure recovery, and continuous nursing care during and after esophagoscopy. Whereas, the supplies required for TNE included intranasal decongestant with oxymetazoline and lidocaine, followed by intranasal packing of the same medications. Each intervention required negligible nursing support. Significant cost differences are anticipated during each component of the procedure. There were no differences in the surgeon's fee (CPT 43200). Total costs for performing TNE in the office were \$1336.28 with an average reimbursement of \$338.55.

CONCLUSIONS: We anticipate significant cost savings when TNE is compared to traditional esophagoscopy.

Combined Approach in the Management of a Dental Appliance Foreign Body

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PURPOSE: The purpose of this study is to illustrate the use of both endoscopic and open techniques in the management of an airway foreign body.

DESIGN: This is a case report of a patient who required both endoscopic and open management of an airway foreign body.

SUMMARY OF RESULTS: The patient is a 27 year old male who presented to the ED with complaints of shortness of breath and airway distress following a seizure and dislodgement of his dental appliance into his glottis. Pt was taken to the OR and underwent direct laryngoscopy with orotracheal intubation, followed by tracheostomy and subsequent laryngofissure for the removal of the dental appliance and laryngeal repair.

CONCLUSIONS: Successful management of airway foreign bodies occasionally requires combined endoscopic and external approach to maximize functional outcomes, as this case demonstrates.

**Outcomes and Treatment-Related Complications in
Patients with HIV Infection and Squamous Cell
Carcinoma of the Head and Neck**

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OBJECTIVE: Review of outcomes and treatment-related complications of patients with squamous cell carcinoma of the head and neck and concomitant HIV infection.

METHODS: A retrospective review of patients diagnosed with squamous cell carcinoma of the head and neck from 2000 to present was conducted. Patients with concomitant HIV infection were identified and analyzed.

RESULTS: A total of 5 patients were identified. Mean age at presentation was 52 years (range 44-56 years). The primary site involved tonsil in 2 cases, oral tongue, larynx and pyriform sinus. 4 out of 5 patients presented with advanced stage (Stage III-IV) tumors. Mean CD4 count at presentation was 462 (range 330 to 634). Mean follow up time was 45 months (range 9 to 68 months). 3 patients were treated with surgery followed by adjuvant chemotherapy and radiation, 1 patient received chemotherapy and radiation and 1 patient underwent radiation therapy. Recurrence rate was 40% (2 patients). 3 patients are currently alive without disease, 1 patient is living with disease and 1 patient died of unknown cause after being without evidence of disease for 9 months. Side effects of chemotherapy and radiation included xerostomia and grade 2-3 mucositis.

CONCLUSIONS: Our results demonstrate that presence of HIV infection did not alter the outcome of patients with squamous cell carcinoma of the head and neck. There were no serious treatment-related complications. We recommend that squamous cell carcinoma of the head and neck receives standard treatment in patients with concomitant HIV infection.

Outcomes Following Neuromuscular Electrical Stimulation Therapy

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Jackson, MS

OBJECTIVE: The objective of the current study is to determine outcomes in Neuromuscular electrical stimulation (NMES) and identify diagnoses with the most improvement after treatment to aid in future patient selection.

STUDY DESIGN: Prospective cohort outcomes study

METHODS: Patients treated for dysphagia with NMES at a tertiary care center were enrolled. Demographics, management, and outcomes data were recorded prospectively. Swallowing function was assessed using the Functional Oral Intake Scale (FOIS) ranging from 1 no oral intake to 7 being total oral nutrition with no restrictions.

Results: Nineteen patients were treated with neuromuscular electrical stimulation therapy over a 12 month period. The most common diagnoses were head and neck cancer (31%), cerebrovascular accident (19%), and trauma (13%). Three patients were lost to follow-up. Of the remaining patients, 10 were male and 6 were female with a mean age of 56.3 years. Swallowing function improved in 11 of 16 patients (69%) while five patients (31%) demonstrated no change. Nine of 16 (56%) were discharged from therapy with an unrestricted diet. The mean swallowing severity scale score improved from an initial FOIS score of 3.8 to a post-treatment score of 6.0.

CONCLUSION: Results of traditional dysphagia therapy have been disappointing when therapy is required beyond the window of spontaneous recovery. Neuromuscular electrical stimulation therapy demonstrates promise as a safe, non-invasive alternative to traditional dysphagia therapy. Further research is warranted to determine which patients will receive the maximal benefit with respect to this type of intervention.

**Management of Laryngotracheal and Esophageal
Disruptions Following “Clothesline” Injury**

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“Clothesline” injuries of the laryngotracheal (LT) complex represent a unique mechanism of injury separable from the more common “blunt crushing” and “penetrating” injuries. Though these various injuries may occur in combination, the pure clothesline injury can present a confusing diagnostic dilemma because there may be little external evidence of trauma. In these cases the severity of the injury is significantly worse than obvious from external inspection.

The “clothesline” injury occurs secondary to a stretching, tearing and ultimate avulsion of the LT complex from the distal trachea. Early recognition and surgical attainment of an airway via tracheotomy with intubation of the distal trachea may be lifesaving. In addition to the LT separation, clothesline injuries may result in stretching and tearing of the recurrent laryngeal nerves and esophagus. Inappropriate initial management may result in bilateral tension pneumothoraces, tension pneumomediastinum, and further LT separation during ill advised attempts at orotracheal intubation and positive pressure ventilation. Timely recognition of this injury and emergent surgical intervention with repair can lead to excellent results.

We report 2 young adult patients both of whom had excellent outcomes after LT, recurrent laryngeal nerve, and esophageal disruptions resulting from ATV clothesline injuries. We review the relevant literature and discuss appropriate management strategies.

Prevention of Pharyngocutaneous Fistula After Laryngectomy

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BACKGROUND: With increasing use of Larynx preservation protocols our rate of postoperative pharyngocutaneous fistulas was as high as 67%. To reduce our fistula rate we introduced routine use of the diverting pharyngostomy [DP].

OBJECTIVE: To evaluate the efficacy of the diverting pharyngostomy and fistula reduction formula after laryngectomy.

DESIGN: Retrospective case series.

SETTING: Tertiary head and neck practice at an Academic Medical Center and affiliated hospitals. **Patients:** A series of 52 patients who had total laryngectomy performed in the last ten years. All patients had advanced laryngeal cancer [stages III and IV]. In 28 cases [group 1] a DP was not performed. Nineteen of these patients had virgin laryngectomies. Twenty four patients [group 2] had a DP along with gastrostomy, interposition of a muscle flap between the mucosal closure and skin closure, broad spectrum antibiotics and anti-reflux therapy. Seven of these patients had virgin laryngectomies and 17 had laryngectomy for salvage. Main outcome measures: Pharyngocutaneous fistula.

RESULTS: Of the 19 virgin laryngectomies in group 1 [no DP], 6 [32%] patients developed pharyngocutaneous fistulas. Of the 9 salvage laryngectomies, 6 [67%] developed fistulas. Among the 24 patients in group 2 [DP], 7 had virgin laryngectomies. None of the seven developed a fistula [0%]. Seventeen patients had salvage laryngectomies and only 3 [18%] developed a fistula. There were no operative mortalities.

CONCLUSIONS: A diverting pharyngostomy and fistula reduction formula has significantly reduced our fistula rate after laryngectomy over the last five years.

Unusual Cases of Neonatal Laryngeal Trauma from Intubation

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PURPOSE: The purpose of this report is to review two unusual cases of laryngeal trauma in neonates resulting from intubation. A pertinent review of the literature is included to support the findings and recommendations made.

DESIGN AND METHODS: Case reports of two patients treated at a tertiary care pediatric medical center.

SUMMARY OF RESULTS: The first case involves an infant with stridor and hoarseness that was found to have disruption of the true vocal fold caused by intubation through the laryngeal ventricle into the subglottis. In the second case, an infant who underwent difficult intubation later developed stridor and dysphagia after extubation and was found to have a fistula from the vallecula to the larynx.

CONCLUSIONS: Traumatic intubation in the neonate may result in significant laryngeal damage. We will discuss the treatment options for these injuries and highlight suggestions for safer intubation in neonates.

Relapsing Polychondritis: Is It Different in Children?

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PURPOSE: Relapsing polychondritis (RP) is a rare inflammatory, possibly autoimmune, potentially destructive disease involving proteoglycan-rich head and neck structures such as auricular, nasal, laryngeal and tracheal cartilage. We report the presentation, management and clinical course of three children with RP, who all had laryngeal involvement with video documentation. We will also include a literature review focusing on pathophysiology, head and neck manifestations, and management of this unusual disease.

DESIGN: Case reports of three children with RP.

SUMMARY: In adults, lobule sparing auricular inflammation is the most common presenting symptom of RP with 50% having laryngeal involvement. RP occurs even less frequently in children, but in this subset, laryngeal involvement may be more common, and its clinical course more benign.

No diagnostic test is currently available. An apparent linkage to human leukocyte antigen DR4, antibodies to collagen II, and concordance with other autoimmune diseases suggests a possible autoimmune pathophysiology. Treatment generally includes immune modulators.

CONCLUSIONS: Characterizing the presentation of RP in pediatric patients may contribute to earlier diagnosis and improved outcomes in this rare disease.

**The Evolving Nature of Pediatric Airway Lesions
Over Time**

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Pediatric airway pathology continues to be addressed through an increasing array of both medical and surgical options as newer techniques such as cricotracheal resection, powered instrumentation, and different techniques in laryngotracheal reconstruction evolve. These are now capable of addressing more complex acquired lesions of the pediatric airway. More recent reports suggest that widely practiced techniques such as cricoid split may be less successful due to the evolving nature of airway pathology in young children. Specifically, if a lesion is more active and a significant inflammatory component exists, the initial pathology may be in the process of evolving to a more permanent stenosis.

We present a case series of five patients in which the evolving pathology is illustrated. In some cases, initial cricoid split or anterior reconstruction of the larynx is adequate for many years followed by symptoms of airway compromise and a secondary diagnosis of posterior laryngeal stenosis. The five presented patients demonstrate follow up of at least 10 years and in all cases a different laryngeal lesion is found from what was initially treated. These patients demonstrate the evolving nature of pediatric airway disease and the importance of involving a long-term approach to the airway of a child and of following a child with airway disease from "infancy to elderly."

Superior Thyroid Cornu Syndrome: An Unusual Cause of Cervical Dysphagia

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INTRODUCTION: Ossification of superior thyroid cornu in the male may cause pharyngeal airway impingement and result in cervical dysphagia. We report on a clinical case series of this rare condition called superior thyroid cornu syndrome (STCS).

MATERIAL AND METHOD: Clinical case series of six patients identified with STCS(2001-2006). All six were males with a mean age 54.8. They complained of cervical dysphagia and/or odynophagia. On flexible laryngoscopy, there is an asymmetric indentation of the pharynx due to a prominent superior thyroid cornu. Laryngeal manipulation produced the pain and exposed the prominent cornu in the airway. CT scan shows calcification of a long superior thyroid cornu without other abnormality.

RESULTS: All six patients were treated by transoral pharyngotomy and resection of a 2cm×0.5cm segment of thyroid cornu. Complete resolution of symptom resulted in 5/6 cases (mean follow up period 19.5 months). One patient reported improved swallow but persistent pain.

CONCLUSION: STCS may be a rare cause of cervical dysphagia. It affects males. It is diagnosed by careful laryngoscopy with laryngeal palpation followed by CT scan. Surgical resection of the affected superior cornu of the thyroid cartilage by transoral pharyngotomy appears effective in relief of symptoms.

**H type Tracheoesophageal Fistula and Anal Stenosis
a Rare Association**

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H type fistula represents a tracheoesophageal fistula without esophageal atresia. It can occur at any level from cricoid cartilage to the carina. Unimpeded passage of a nasogastric tube normally rules out the most common type of tracheoesophageal fistula. An H type tracheoesophageal fistula will not be suspected until further respiratory complications arise. Association of tracheoesophageal fistula along with VATER complex and imperforate anus is very rare. Association of anal stenosis with tracheoesophageal fistula is not reported so far. The presence of anal stenosis and passage of meconium delayed the diagnosis in our patient.

There is no published report on association of anal stenosis and H type tracheoesophageal fistula. We report a case of congenital anal stenosis associated with H type tracheoesophageal fistula and outline several clinical dilemmas encountered in a neonate with this combination of rare congenital anomalies.

**Airway Obstruction: An Unusual Presentation of
Benign Laryngeal Polyps**

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OBJECTIVE: Benign laryngeal polyps usually present with hoarseness or dysphonia. There have been a few reported cases, however, of these lesions causing airway obstruction. Our goal is to present our series of obstructing laryngeal polyps.

METHODS: A retrospective review of all patients treated by the senior author with benign laryngeal lesions presenting with airway obstruction between 1997 and 2006 was performed. Detailed information on the demographics, presenting signs and symptoms and surgical procedure were recorded. Preoperative and postoperative laryngoscopies were reviewed.

RESULTS: Ten patients were identified. There were 7 females and 3 males. The mean age was 49 years (range 34-64). All had a history of smoking, with a mean of 35.2 pack-years (range: 7.5-112.5). All underwent microlaryngoscopy with excision of the lesions. Jet ventilation or a small endotracheal tube was used to secure the airway. The mean follow-up was 71.2 days (range: 25-208), with one patient being lost to follow-up. An excellent airway and improved voice was achieved in all.

CONCLUSION: Benign laryngeal polyps may present with airway obstruction. Normal airway and improved voice can be achieved by microlaryngeal excision without the need for tracheotomy.

**Revision Medialization Laryngoplasty: Indications
and Technique**

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OBJECTIVES: Medialization laryngoplasty by open laryngeal framework surgery remains a standard of care for unilateral vocal cord paralysis. The purpose of this study was to evaluate failure etiology for patients requiring a secondary medialization procedure as well as outline technical approaches for revision surgery.

STUDY DESIGN: Retrospective clinical review at a tertiary referral center.

METHODS: Review of all medialization laryngoplasty cases treated at our institution by the authors over a sixteen-year period to determine the influence of implant type and surgical approach on primary treatment failures.

RESULTS: Over eight hundred patients undergoing an initial medialization procedure were reviewed. Approximately ten percent of these cases required a revision surgical procedure consisting of open medialization with or without arytenoid adduction. A surgical protocol including critical evaluation of the initial operative report, removal of all capsular scar tissue by microdissection and proper assessment of thyroarytenoid muscle at the time of revision was utilized. When needed, an inferiorly based sternohyoid muscle flap was employed in select cases with technique outlined.

CONCLUSIONS: Successful and safe revision medialization laryngoplasty is possible when based on critical surgical guidelines. A surgical protocol that relies on the same principles fundamental to achieving satisfactory results in primary procedures can successfully revise patients with poor results from an initial medialization procedure.

**Expression of Retinoic Acid Receptors in Human
and Rat Vocal Folds**

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Vitamin A regulates the expression of numerous genes for the development and maintenance of various organs, and is reported to be present in the macula flava of human and rat vocal folds. Retinoic acid is the active form of vitamin A and retinoic acid receptors (RARs) are known to be essential to vitamin A mediated gene regulation. However, it remains unknown if RARs are expressed in human vocal folds. The purpose of this study was to examine the expression of RARs in human and rat vocal folds and estimate the feasibility of the rat as an animal model for vocal fold vitamin A research. Three human larynges obtained from autopsy cases and six rat vocal folds were used in this study. Expression of RAR-alpha and beta in the vocal fold was analyzed using immuno-staining. RAR-alpha was expressed in the stellate cells of human and rat macula flavae. RAR-beta was expressed in the epithelial cells of both human and rat. The expression of RARs in vocal folds suggests that vitamin A is not only stored in the vocal folds but also acts as a regulatory factor. In addition, the resemblance of RAR expression patterns across human and rat suggests that the rat is a useful animal model for understanding the role of vitamin A in vocal folds.

Paradoxical Vocal Fold Motion: An Inflammatory Etiology

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Paradoxical Vocal Fold Motion (PVFM) is a movement disorder of the vocal folds in which the vocal folds adduct during inspiration. Symptoms include shortness of breath, choking, cough and dysphonia. Previous studies have suggested that patients with PVFM have a high propensity for gastroesophageal reflux disease (GERD, a condition that would support an inflammatory hypothesis.

However, previous studies have grouped patients with asthma or other pulmonary diseases in studies of PVFM. The purpose of the present study was to determine the contributions of inflammation and reduced sensation in a group of subjects diagnosed with PVFM with the primary complaint of cough and secondary complaint of shortness of breath or choking. Measurement of laryngeal adductor reflex (LAR) using a calibrated air pulse, symptoms of reflux using the Reflux Symptom Index (RSI) and pulmonary function testing using spirometric data were obtained from 20 subjects to determine the contribution of inflammatory conditions in the larynx in patients with PVFM. The results suggest that as sensation decreases, the presence of inflammatory conditions increases. The authors interpret the data in the context of a vagal contribution to the presence of PVFM

Regeneration of the Trachea Using a Bio-Engineered Scaffold with Adipose Derived Stem Cells

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Kyoto City, Kyoto

PURPOSE OF THE STUDY: Our group has developed and clinically used an artificial graft made from collagen sponge scaffold with polypropylene mesh in order to regenerate the tracheal tissue. However, the artificial graft requires about two months for epithelial regeneration. The purpose of the present study is to accelerate regeneration process of the trachea using a bio-engineered scaffold effectively. Adipose derived stem cells (ASCs) have multilineage differentiation capability such as vessel, fibroblast, and so on. In our current study, we implanted the bio-engineered scaffold with autologous ASCs onto the tracheal defects of rats.

METHODS: Collagenous gel, including mYFP-labeled ASCs of rats, was stratified on the surface of the collagenous sponge as a bio-engineered scaffold. This scaffold was implanted onto the tracheal defects of rats, while the control scaffold without ASCs was implanted. After the operation, histological and immunohistochemical examinations were made with an antibody to the von Willebrand factor (vWF), a vascular endothelium-specific antigen.

SUMMARY OF RESULTS: At 14 days after the operation using the bio-engineered scaffold with ASCs, a well-developed pseudostratified columnar epithelium with well-differentiated ciliated and goblet cells, similar to a normal tracheal epithelium, was regenerated compared to a control model. Immunohistochemical study showed neovascularization in the layer of the subepithelium, and also implanted mYFP-positive ASCs were found around these vessels.

CONCLUSIONS: These results suggested that implanted ASCs accelerated neovascularization and epithelization on the regenerated trachea. Our developed bio-engineered scaffold with ASCs will contribute to regeneration of the tracheal tissue.

Post-viral Vagal Neuropathy

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BACKGROUND: Postviral vagal neuropathy (PVVN) is a clinical diagnosis characterized by laryngeal complaints initiated by an upper respiratory infection (URI). Little is known about the natural history of this disease, and only small case series have been reported.

OBJECTIVE: To describe the clinical presentation, symptoms, patient demographics, and natural history of PVVN.

METHODOLOGY: A cross-sectional survey of all patients diagnosed with PVVN (01/01/06 - 10/01/06) was prospectively administered, detailing disease onset, type and duration of systems, demographics, and previous treatment. The Reflux Symptom Index (RSI), Voice Handicap Index (VHI), and laryngoscopic findings were collected for each patient.

RESULTS: Forty-one subjects with PVVN were identified (mean age 49 (+13), 71% female). The most common initial URI symptoms were cough (90.2%), nasal/sinus congestion (75.6%), and rhinorrhea (63.4%). Sixty-one percent took antibiotics, and the mean time between symptom onset and presentation to the laryngologist was 80.8 weeks (+128.6). The most common persistent symptoms were cough (53.7%), throat clearing (43.9%), dysphonia (41.5%), and vocal fatigue (39%). Fifty-eight percent consulted three or more physicians for their symptoms. Mean VHI was 13.4 (+10.3), and mean RSI was 17.7 (+11). Forty-nine percent had vocal fold paresis on stroboscopy.

CONCLUSIONS: PVVN is a clinical entity characterized by a complex of laryngeal symptoms initiating after a URI. Symptoms include chronic cough, excessive throat clearing, dysphonia, and vocal fatigue. Affected individuals are typically in their 5th decade of life and appear more likely to be women. Most patients have seen multiple physicians, and time to laryngologist referral is often delayed.

**Development of a New Generation of High
Dexterity, Manual Robotic Instruments for
Microlaryngeal Surgery. A Technical Feasibility
Study on an Airway Mannequin**

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This is a feasibility study to evaluate the use of a manual robotic instrument for transoral pharyngeal and laryngeal surgery aimed at improving the technical ease, precision, and time requirements of existing surgical procedures.

We compare parameters and workstation assessments for the use of the manual robotic instrument as compared to the conventional microlaryngeal instruments on an airway mannequin. We assess the physical parameters important for a successful accomplishment of the procedures. Variables that we study include: type of telescope, instrument shaft diameter, height and type of the pivotal point, type of retractor used. We correlate these variables with the subsequent anatomical exposure and range of movements of the instrument.

Different combinations of microlaryngeal instruments (conventional and manual robotic), telescopes (0°-30°) and retractors (laryngoscopes, mouth gags) and their positions were used in order to assess the most feasible combination in terms of freedom of movement exposure. The combination of one manual robotic instrument-one conventional instrument versus conventional instruments in both hands was evaluated.

The manual robotic instruments (10 and 5 mm) featured a wider range of movements in all laryngeal subsites as compared to the conventional instruments. A mouth gag or a bivalve laryngoscope allowed a better exposure than the conventional laryngoscope.

Manual robotic instruments represent a new generation of high dexterity instruments that, we believe, will increase the technical ease and precision of microlaryngeal procedures. Further studies on cadavers and animals are needed.

Efficacy of Additional Injection Laryngoplasty After Framework Surgery

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Kurume Japan.

PURPOSE OF THE STUDY: The purpose of this study is to clarify the efficacy of additional injection laryngoplasty (AIL) against remaining glottal gap after framework surgery (FS).

DESIGN AND METHOD OF STUDY AND ANALYSIS: Forty-seven patients with unilateral vocal fold paralysis underwent FS (thyroplasty: TP; 21, arytenoid adduction surgery: AA; 18, and arytenoid adduction with thyroplasty: AAT; 8) during the period of 1994 to 2006. To acquire a better voice, eight (17%) of 47 patients underwent AIL to overcome the remaining glottal gap. Three patients received silicone injection and five received autologous fat injection after FS. Five (28%) of 18 patients received AIL after AA, Two (25%) of 8 received after AAT and one (5%) of 21 received after TP. Voice function before and after the surgery was examined using following parameters; maximum phonation time (MPT sec), mean air flow rate during phonation over comfortable duration (MFRc ml/sec), pitch perturbation quotient (PPQ %), amplitude perturbation quotient (APQ %), normalized noise energy for 0 to 4 kHz (NNEa dB).The voice function was evaluated before and 12 months more after the surgery using a paired t-test.

SUMMARY OF RESULTS: Every parameter improved significantly ($p < 0.01$) after FS in comparison to before. In comparison TP, AIL is highly required in AA for better voice function after surgery. AIL provided better voice function in every patient.

CONCLUSIONS: Our results indicate that AIL will be effective in patient who still has glottal gap after FS.

Rigid Endoscopic Removal of a Large Esophageal Foreign Body (Tablespoon)

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PURPOSE: To demonstrate the superior ability of the otolaryngologist in management of a very large esophageal foreign body.

METHOD: Case Report.

INTRODUCTION: A 31 year old male with a history of bulimia nervosa presented to the emergency department after accidentally swallowing a tablespoon while trying to self-induce vomiting. Per report of the initial physical exam, the handle of the spoon was visible in the posterior oropharynx. The emergency department staff therefore attempted a direct laryngoscopy and upon manipulation of the handle, a peristaltic wave pulled the spoon distally into the esophagus and out of view. A chest radiograph showed the end of the spoon in the fundus of the stomach and the handle in the distal esophagus. The gastroenterology service was then consulted by the emergency department for flexible endoscopy. The flexible endoscopy was unsuccessful secondary to inability to adequately sedate the patient. At this point, the otolaryngology service was asked to evaluate the patient.

RESULTS: The patient was taken to the operating room and placed under general anesthesia. Rigid esophagoscopy was performed with video monitoring and the handle of the spoon grasped with large foreign body forceps. The spoon and esophagoscope were then pulled proximally until the handle protruded from the patient's mouth. The handle was grasped manually and the end of the spoon negotiated past the cricopharyngeus producing the 20 cm tablespoon.

CONCLUSION: The otolaryngologist is well equipped with rigid instruments and a thorough knowledge of the upper aerodigestive tract in managing large esophageal foreign bodies.

A Mixed-Flow Vascular Malformation of the Hypopharynx

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BACKGROUND: Vascular malformations are uncommon lesions of the upper aerodigestive tract in adults. Diagnosis is challenging secondary the difficulty associated with obtaining adequate biopsy specimens of these submucosal masses. Imaging studies may be nondiagnostic.

METHODS: We review the challenging management what is to our knowledge the first identified case of a mixed-flow vascular malformation of the hypopharynx.

RESULTS: The pyriform sinus lesion was discovered incidentally, and imaging was suspicious for malignancy. Multiple biopsies under general anesthesia were non-diagnostic. Finally, the CO2 laser was used to enter the lesion and obtain a diagnostic specimen. The patient was managed conservatively with close observation and remains asymptomatic two years after presentation.

CONCLUSIONS: The differential diagnosis for submucosal masses of the hypopharynx is reviewed. The classification, evaluation and management of head and neck vascular malformations are discussed in the context of this challenging case with emphasis on use of the laser to obtain definitive diagnosis.

**Preliminary Comparison of an Oropharyngeal
Aerosolized pH Probe and a Standard Dual pH
Probe for Diagnosis of Laryngopharyngeal Reflux**

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PURPOSE: To compare the ability of an oropharyngeal aerosolized pH probe and a standard dual pH probe in measuring laryngopharyngeal reflux (LPR)

DESIGN: Prospective clinical trial

METHODS: Subjects were nonsmokers with symptoms consistent with LPR as measured by a Reflux Symptom Index > 13 who were not receiving treatment with an H2 blocker or PPI. All subjects had 24 hour simultaneous placement of the ResTech Dx-pH measurement system (San Diego, CA) and a standard dual pH probe. The baseline pH, as well as the number and severity of reflux events as measured by the two devices were compared.

RESULTS: The mean pH measurements over 24 hours (excluding meals and sleeping) were 6.0 (standard UES probe) and 7.0 (aerosolized probe). The aerosolized probe successfully registered 18 of 20 reflux events (90%) in two subjects measured by the UES probe. The aerosolized probe consistently recorded higher pHs than the UES probe. The mean (SD) differences in pH measured by the two probes immediately before, during, and immediately after reflux events were 1.0 (0.4), 2.3 (1.2), and 1.1 (0.4), respectively.

CONCLUSIONS: These preliminary data suggest that the aerosolized probe has the ability to reliably document LPR events when compared to the gold-standard dual probe. Event severity is less when measured with the aerosolized probe, which is expected given the method of pH acquisition. A different event threshold may therefore be necessary. The availability of a well-tolerated, reliable pH device could allow otolaryngologists to easily acquire objective data in the workup of LPR. Further subjects are currently being tested.

**Pediatric Airway Evaluation: A Novel Anesthetic
Technique for Dynamic Airway Assessment**

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John Koller, MD, FRCP(C)*
Boston, MA

OBJECTIVE: We present an anesthetic technique for dynamic assessment of the pediatric airway.

BACKGROUND: The otolaryngologist is frequently called upon to evaluate various structural and functional airway disorders in the pediatric patient. Examination of the airway from the nares to the distal bronchi in the operating room is vital for a thorough assessment. Not only is the static assessment of these structures important, but also the dynamic airway assessment is invaluable in arriving at the correct diagnosis. We have seen patients with an unrevealing bedside fiberoptic airway evaluation and a normal rigid endoscopy of the larynx, only to have a flexible bronchoscopy in the operating room demonstrate a dynamic disorder of the airway.

STUDY DESIGN: Retrospective chart review.

METHODS: The charts of 50 consecutive pediatric patients who underwent airway evaluation in the operating room were examined. These patients underwent an anesthetic technique with two components—1) for flexible bronchoscopy and 2) for rigid bronchoscopy. The flexible bronchoscopy was first performed under a narcotic and dissociative-agent anesthesia, which permits spontaneous breathing. Once the dynamic airway assessment was complete, these patients were then given an inhaled anesthetic and neuromuscular blockade for examining the static airway with a rigid bronchoscope.

RESULTS: All patients underwent a complete airway examination, with both static and dynamic assessments. There were no intraoperative or postoperative complications encountered in our series.

CONCLUSIONS: The anesthetic technique we describe allows for a thorough evaluation of the airway safely, with the superior advantage of assessing dynamic disorders of the airway.

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