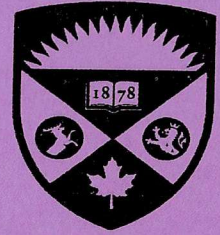




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**Department of Otolaryngology -
Head and Neck Surgery**

THIRTY-NINTH ANNUAL

RESIDENTS' RESEARCH DAY

**Friday, May 24, 2013
Conron Hall, University College
Western University • Canada**

PLANNING COMMITTEE MEMBERS

Disclosure Form

I have/have not had in the past 2 years, a financial interest, arrangement or affiliation with one or more organizations that could be perceived as a direct/indirect conflict of interest in the content of the subject of this or any other program.

1. Anthony Nichols: None
2. Lorne Parnes: None
3. Brian Rotenberg: Medtronic Canada and ReVENT Medical

RESIDENTS' RESEARCH DAY PROGRAM 2013

- 8:00 – 8:30 *COFFEE IN THE EXHIBITORS' AREA*
- 8:30 – 8:35 **WELCOME and Introduction of CPD Director** **Dr. John Yoo**
- 8:35 – 8:40 **INTRODUCTION of MORNING CHAIR** **Dr. Brian Rotenberg**

CHAIRMAN – DR. SUMIT AGRAWAL

- 8:45 – 9:00 **Dr. Winsion Chow** High Frequency of Activating PIK3CA Mutations in HPV Positive Oropharyngeal Cancer
- 9:00 – 9:15 **Dr. Samantha Tam** Olfactory Outcomes following Endoscopic Pituitary Surgery With or Without Septal Flap Reconstruction: A Randomized Controlled Trial
- 9:15 – 9:30 **Dr. David Yeh** Routine Histopathology of Nasal Polyps in Endoscopic Sinus Surgery
- 9:45 – 10:15 *COFFEE IN THE EXHIBITORS' AREA*
- 10:15 – 10:30 **Dr. Jordan Glicksman** The Association Between Caffeine Exposure and Incident Tinnitus
- 10:30 – 10:45 **Dr. Christopher Chin** High Volume Saline Irrigation in the Post-Operative Management of Chronic Rhinosinusitis
- 10:45 – 11:00 **Dr. Jenna Theriault** Objective Acoustic Evaluation of Velopharyngeal Insufficiency
- 11:00 – 11:15 **INTRODUCTION of DR. MICHAEL STEWART**
- 11:15 – 12:00 **Dr. Michael Stewart** Objective versus Subjective Outcomes in Otolaryngology
- 12:00 – 1:00 *LUNCH IN THE GREAT HALL, SOMERVILLE HOUSE*

Brian Rotenberg
Dr. John Yoo

CHAIRMAN – DR. DUNCAN MACRAE

1:00 – 1:10 **WELCOME BACK**

1:10 – 1:25 **Dr. Sammy Khalili** Correlates of Tracheoesophageal Voice Restoration Outcomes: A Surgical, Acoustic, and Perceptual Investigation

1:25 – 1:40 **Dr. Susan Tan** The Aesthetic Unit Principal of Facial Aging

1:40 – 1:55 **Dr. Brandon Wickens** Metrics for Evaluating Surgical Microscope Usage During Myringotomy

2:00 – 2:10 **INTRODUCTION of DR. MARK TAYLOR** **Dr. Corey Moore**

2:10 – 2:55 **Dr. S. Mark Taylor** Lessons Learned in Otolaryngology - HNS

2:55 – 3:40 **Interactive Discussion** **Dr. Duncan MacRae**

3:40 – 3:50 **PRESENTATION OF AWARDS**

3:50 – 4:00 **Evaluation Form Completion**

HIGH FREQUENCY OF ACTIVATING PIK3CA MUTATIONS IN HPV POSITIVE OROPHARYNGEAL CANCER

Dr. Winsion Chow

OBJECTIVE:

Large scale whole exome sequencing studies of head and neck squamous cell carcinoma (HNSCC) have suggested that activating mutations in PIK3CA are more common in patients with human papillomavirus (HPV)-positive tumors. We aim to determine the frequency of activating mutations in HPV-positive and negative oropharyngeal cancers.

METHODS:

We identified 89 oropharyngeal cancer samples with adequate tumor for analysis. DNA from pretreatment primary site biopsy samples were tested for high-risk HPV types 16 and 18 by real time PCR. Forty-eight HPV-positive and 41 HPV-negative samples were tested for activating mutations at codons 542, 545 and 1047 by PCR followed by Sanger sequencing.

RESULTS:

Two of the 41 (5%) HPV-negative tumors demonstrated PIK3CA mutations, including a E542K and a E545K mutations. Eighteen of 48 (37%) HPV-positive tumors demonstrated activating PIK3CA mutations. Of these, 8 (44%) were at codon 542, 6 (33%) at codon 545, and 4 (22%) at codon 1047.

CONCLUSIONS:

Although there has been a suggestion that activating PIK3CA mutations are common in HPV-positive HNSCC, this is the first study to clearly identify this phenomenon. Targeting PIK3CA with molecular agents in HPV-positive patients may be a mechanism to improve cure rates and decrease treatment toxicity in this rapidly growing cohort of patients.

Supervisor: Dr. Anthony Nichols

OLFACTORY OUTCOMES FOLLOWING ENDOSCOPIC PITUITARY SURGERY WITH OR WITHOUT SEPTAL FLAP RECONSTRUCTION: A RANDOMIZED CONTROLLED TRIAL

Dr. Samantha Tam

BACKGROUND:

Postoperative hyposmia and anosmia is an often overlooked complication of endoscopic pituitary surgery. Septal flaps have been utilized as a strategy for repairing and preventing postoperative cerebrospinal fluid (CSF) leaks. The olfactory impact of raising this flap for sellar reconstruction and CSF repair needs qualitative assessment. This study aims to ascertain the effect of the Hadad-Bassagasteguy (HB) flap on olfaction in endoscopic pituitary surgery.

METHODS:

In this randomized controlled trial, patients undergoing pituitary surgery underwent computerized randomization. Those in Group 1 all had HB flaps raised and placed for sellar floor defects. Those in Group 2 underwent reconstruction with synthetic or nonautologous materials. The University of Pennsylvania Smell Identification Test (UPSIT) was administered preoperatively and 6 months postoperatively. Results were analyzed using nonparametric tests.

RESULTS:

Twenty subjects were enrolled, 10 in each group. Eight subjects in Group 1 vs 3 in Group 2 had intraoperative CSF leak. All were repaired intraoperatively and none required additional intervention. Preoperatively, UPSIT scores were not significantly different between groups ($p = 0.62$). Preoperative vs postoperative comparisons were significant for a decrease in scores in both groups postoperatively (Group 1, $p < 0.001$; Group 2, $p < 0.001$). Those undergoing HB flap reconstruction had significantly worse scores postoperatively ($p = 0.001$).

CONCLUSION:

Endoscopic pituitary surgery results in decreased olfaction with or without deploying a septal flap. However, use of the HB flap for reconstruction can worsen hyposmia at least 6 months after surgery. Olfaction should be considered when use of the HB flap is planned.

Supervisors: Dr. Neil Duggal, Dr. Brian Rotenberg

ROUTINE HISTOPATHOLOGY OF NASAL POLYPS IN ENDOSCOPIC SINUS SURGERY

Dr. David Yeh

OBJECTIVE:

Routine histopathology is a well accepted practice for nasal polyp specimens obtained during endoscopic sinus surgery for chronic rhinosinusitis. On occasion, entities other than inflammatory nasal polyps are discovered with histopathological analysis. Some studies in the literature suggest that routine histopathology of nasal polyps is unnecessary as very few unexpected diagnoses are discovered which subsequently change management. We look to further support this hypothesis with our own series and to demonstrate the costly nature of this intervention

METHODS:

We performed a chart review of prospectively gathered data on all patients who underwent endoscopic sinus surgery by a single surgeon from June 1, 2007 to June 30, 2012. We compared the preoperative diagnosis with the histopathological diagnosis in all cases and determined the number of incongruous diagnoses and subsequently determined the number needed to screen. Cost analysis was performed by determining the cost of reviewing each pathological specimen.

RESULTS:

In cases of bilateral chronic rhinosinusitis with nasal polyposis, only 2 cases of 443 pathological specimens were identified as having a clinically significant unexpected diagnoses. These two cases account for 0.45% of all specimens reviewed.

Supervisor: Dr. Brian Rotenberg

THE ASSOCIATION BETWEEN CAFFEINE EXPOSURE AND INCIDENT TINNITUS

Dr. Jordan Glicksman

OBJECTIVE:

Tinnitus is a highly prevalent condition estimated to affect 50 million Americans and is severely disabling among up to 3 million. Caffeine is a commonly consumed substance that has long been thought to play a role in the development of tinnitus, but prospective data are lacking.

METHODS:

We prospectively evaluated the association between caffeine intake and self-reported tinnitus. Participants were 72,326 women in the Nurse's Health Study II, aged 30-44 years and without tinnitus at baseline in 1991. Study participants completed questionnaires about lifestyle and medical history every two years and food frequency questionnaires every four years. Information on self-reported tinnitus and date of onset was obtained from the 2009 questionnaire, with cases defined as symptoms "a few days/ week" or "daily." Multivariable-adjusted hazard ratios (HRs) were calculated using Cox proportional hazards regression models.

RESULTS:

Over the 18-year period, 5,353 incident cases of tinnitus were identified. Compared to women in the lowest category of caffeine intake (<150 mg/ day), the multivariable adjusted hazard ratio for tinnitus for those in the highest intake category (600 or more mg/day) was 0.77; 95% confidence interval, 0.69-0.90. An inverse association was demonstrated between the level of caffeine consumed and the incidence of tinnitus (p for trend < 0.001).

CONCLUSIONS:

In this prospective study, higher caffeine consumption was associated with a lower risk of tinnitus.

Supervisor: Dr. Gary Curhan, Channing Laboratory, Harvard School of Public Health

HIGH VOLUME SALINE IRRIGATION IN THE POST-OPERATIVE MANAGEMENT OF CHRONIC RHINOSINUSITIS

Dr. Christopher Chin

OBJECTIVES:

To compare high volume saline irrigation (HVSI, NeilMed Sinus rinse) to low volume saline irrigation (LVSI, Salinex) in the early post-operative period in patients with chronic rhinosinusitis (CRS).

METHODS:

Multicenter, randomized, single blinded trial. Participating sites across Canada enrolled ten patients each. Patients were randomized to either HVSI or LVSI after endoscopic sinus surgery. Surgeons were blinded to treatment. One-month post-operative scores for the subjective sinonasal outcomes (SNOT-22) scale and objective perioperative sinus endoscopy (POSE) scales were compared to pre-operative scores.

RESULTS:

Preliminary analysis on the first reporting centers showed similar baseline characteristics between the two groups. There was no difference between HVSI and LVSI for either scale preoperatively or postoperatively. There was significant postoperative improvement in both groups for both SNOT-22 and POSE scales compared to baseline: preoperative HVSI SNOT-22 48.2 (95% CI 35.8-60.5) vs postoperative 15.7 (9.7-21.6); preoperative LVSI SNOT-22 49.1 (40.4-57.8) vs postoperative 16.5 (9.6-23.4); preoperative HVSI POSE 16.7 (13.2-20.1) vs postoperative 5.6 (2.9-8.3); preoperative LVSI POSE 16.0 (13.4-18.5) vs postoperative 7.1 (4.5-9.7).

CONCLUSION:

Early data from this study shows significant subjective and objective improvement at one month postoperatively, but with no difference between HVSI and LVSI. Data collection is ongoing.

Supervisor: Dr. Brian Rotenberg

OBJECTIVE ACOUSTIC EVALUATION OF VELOPHARYNGEAL INSUFFICIENCY

Dr. Jenna Theriault

OBJECTIVES:

To develop a non-invasive method of examining the velopharyngeal port in children and adolescents with velopharyngeal insufficiency.

STUDY DESIGN:

Prospective non-blinded cohort study.

METHODS:

Ten children aged 7 to 12 years (5 males, 5 females) participated. All participants were diagnosed with VPI through an examination performed by an experienced Pediatric Otolaryngologist and/or Speech-Language Pathologist. Each child was fitted with a microphone (15 cm from their mouth) and asked to produce sustained productions (3 repetitions each) of 3 vowels, /a/, /i/, and /u/. Vowel samples were digitized on a laptop computer using SonaSpeech II (Kay Pentax, Pinebrook, NJ). An amplitude-by-time waveform of each speech segment was generated and analyzed with the readily available open-access Praat software program. A 1-second segment was extracted from the mid-portion of each vowel and formant frequencies of F1, F2, and F3 were generated with numeric results provided in Hz. Means and standard deviations of F1, F2, and F3 frequencies for the three vowels were calculated. These data points were then compared to a normative database of age matched control participants. In addition to the vowel assessment, each participant was evaluated with nasometry. Children were asked to repeat standardized sentences containing high pressure consonants. An average nasalance score for each sentence, and a total mean nasalance score were then obtained. Pearson product moment correlations were calculated between nasalance scores and F1 and F2 measures for each vowel production.

RESULTS:

Our data demonstrate that while proportional F1-F2 and F2-F3 relationships for all 3 vowels are similar in pattern to normal children, they are restricted for those with VPI. Similar mean values with standard deviations for F1 and F2 were demonstrated among children with VPI, compared to the normative database. When formant frequencies were considered in the context of nasalance scores (i.e., SNAP), Pearson product moment correlation did not consistently determine a relationship between the two variables.

CONCLUSION:

The present data clearly reveal that acoustic quantification of vowel formant structure can serve to objectively index vocal tract (VT) status. With increasing access to no cost acoustic analysis programs via the internet, acoustic measures from vowels may be exploited to document performance, and potentially monitor change over time in children with VPI.

Supervisors: Dr. Murad Husein, Dr. Philip C. Doyle

CORRELATES OF TRACHEOESOPHAGEAL VOICE RESTORATION OUTCOMES: A SURGICAL, ACOUSTIC, AND PERCEPTUAL INVESTIGATION

Dr. Sammy Khalili

OBJECTIVE:

To explore the influence of surgical variables on dynamic signal analysis in patients that have undergone tracheoesophageal puncture voice restoration.

METHODS:

Thirty patients who had undergone total laryngectomy or laryngopharyngectomy and tracheoesophageal (TEP) were assessed postoperatively. The primary measure was obtained using comprehensive auto-correlation analysis and resultant phase portraits based on chaos theory. Covariates including timing of pharyngectomy defect, presence of pharyngocutaneous fistula, prior history of esophageal stricture requiring dilatation, and major post-operative complications were considered. Individual performance data were assessed by two blinded observers (one experienced and one expert) to determine if any variable affected voice outcome.

RESULTS:

Data from this investigation indicate that the TE voice source is a complex acoustic signal that may comprise at least 5 separate and distinct signal subtypes based on phase portrait assessment. Prior work in our laboratory has suggested that three distinct groups exist. However, the present analysis permits the potential to distinguish TE voice signal characteristics in relationship to structural characteristics of the postsurgical voice source. In doing so, the dynamic interplay of form and function is enhanced. Groups were also identified in relationship to covariates. Based on the data generated, phase relationships may serve as a valuable index of speaker performance for future investigation and may optimize approaches to surgical reconstruction.

CONCLUSION:

This investigation systematically quantified subgroups of the voicing source for a group of 30 TEP voice restoration speakers. While there is a common misperception that all postlaryngectomy speakers who undergo TEP voice restoration will produce voices that are within a narrow range of performance across frequency, amplitude, and temporal domains, the present data suggest that considerable variability exists. This project has been able to further expand our knowledge of TEP subgroups via dynamic phase relationships. Collectively, the present data suggest that more refined indices of surgical variables may allow for enhanced understanding of this unique TEP voice generation system. These data may also be used to inform patients regarding the potential for voice variability post-TEP.

Supervisors: Dr. Kevin Fung, Dr. Philip C. Doyle

THE AESTHETIC UNIT PRINCIPAL OF FACIAL AGING

Dr. Susan Tan

OBJECTIVES:

In youth, facial aesthetic units flow together without perceptible division. The face appears as one dynamic structure with a smooth facial contour and very little if any shadowing between different anatomical regions of the face. As one ages, facial aesthetic units slowly become separated from one another. This may be due to differences in skin thickness, composition of subcutaneous tissue, contour of the facial skeleton and location of facial ligaments. Although the impact of aesthetic unit separation is clinically apparent, its fundamental role in perceived facial aging has not yet been empirically defined. This investigation sought to demonstrate and define the impact of aesthetic unit separation on facial aging and, consequently, empirically validate the rationale for blending of aesthetic units as a principle for facial rejuvenation.

METHODS:

Photographs of seven adult females were prepared for experimental evaluation of the presence or absence of facial aesthetic unit separation. Photo stimuli were then presented to naïve observers in a blinded paired comparison (PC) evaluation. For each stimulus pair, observers were asked to select the face which they considered as more youthful in appearance. All stimuli were compared to all others. A preferential rank list was then generated from the most to the least youthful.

RESULTS:

24 observers evaluated 224 pairs of photographs, thus generating 5376 responses for analysis. Faces without facial aesthetic unit separation were consistently judged to be more youthful than their original or modified counterparts. Additionally, and as a group, those faces that exhibited increasing aesthetic unit separation were ranked lowest on the preference rank list compared to photographs without aesthetic unit separation.

CONCLUSIONS:

Our data support the hypothesis that facial aesthetic unit separation influences perceived facial youthfulness amongst female photographs. The presence of facial aesthetic unit separation results in a less youthful appearance. Based on these empirical data, the concept of the facial aesthetic unit separation appears to play a significant role in perceived facial aging.

Supervisors: Dr. Corey Moore, Dr. Philip C. Doyle

METRICS FOR EVALUATING SURGICAL MICROSCOPE USAGE DURING MYRINGOTOMY

Dr. Brandon Wickens

INTRODUCTION:

Although teaching and learning surgical microscope maneuvering is a fundamental step in Otolaryngology surgical training, currently there is no objective method to teach or assess this skill. This study was designed to implement and test sets of metrics capable of quantitatively and qualitatively evaluating microscope use and surgical expertise of subjects during tympanostomy tube placement.

METHODS:

8 Otolaryngology residents and 4 Otolaryngology consultants were asked to use a microscope to insert a tympanostomy tube into a cadaveric myringotomy in a standardized setting. Microscope movements were tracked in 3 dimensional space and tracking metrics were applied. The procedure was video-recorded and then analyzed by blinded experts using operational metrics. Results from both groups were compared, and discriminatory metrics were determined.

RESULTS:

The following tracking metrics were identified as discriminatory: time, rotation, volume, smoothness, jitter, and number of microscope repositions. A variety of operational metrics were compared and discussed.

CONCLUSION:

These metrics could form the basis of an automated system for providing feedback to residents during training using a myringotomy surgical simulator. Additionally, these metrics may be useful in guiding a standardized teaching and evaluation methodology.

Supervisors: Dr. Sumit Agrawal, Dr. Philip C. Doyle, Dr. Hanif M. Ladak

AWARDS & PRIZES

SCIENTIFIC ACHIEVEMENT AWARD:

Presented for the most impactful research project.

Charles A. Thompson Plaque

PETER CHESKI INNOVATIVE RESEARCH AWARD

Presented for the most innovative research project.

DEPARTMENT OF OTOLARYNGOLOGY – HEAD AND NECK SURGERY AWARD for PERFECT PITCH

Presented for the most eloquent presentation.

RESIDENT BOOK AWARDS

Presented to residents who did not receive one of the above awards.

SIMON KIRBY MOST CARING RESIDENT AWARD

Presented to the resident who demonstrates excellence in compassionate care.

UNDERGRADUATE TEACHING AWARD

Presented to the resident with the highest teaching evaluation.

DISTINGUISHED VISITING PROFESSOR

**Department of Otolaryngology -
Head and Neck Surgery**

DR. MICHAEL STEWART

Professor & Chair

***Department of Otolaryngology,
Vice Dean of Weill Medical College
Cornell University, New York***

Sponsored by Merck Canada

DISTINGUISHED ALUMNUS

**Department of Otolaryngology-
Head and Neck Surgery**

DR. S. MARK TAYLOR

Professor

***Department of Otolaryngology –
Head & Neck Surgery
Dalhousie University, Nova Scotia***

Sponsored by Med-el Canada

SPONSORS

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