



Department of Otolaryngology- Head and Neck Surgery

Thirty-Fifth Annual

RESIDENTS' RESEARCH DAY

**Friday, April 24, 2009
The London Hunt and Country Club**

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. Howard Lampe: None
2. Gordon LeBoldus: None
3. Corey Moore: None

RESIDENTS' RESEARCH DAY PROGRAM 2009

8:30 – 9:10 **COFFEE IN THE EXHIBITORS' AREA**

9:10 – 9:25 **WELCOME** Dr. Yoo

CHAIRMAN – DR. GORDON LEBOLDUS

9:25 – 9:30 **INTRODUCTION OF DR. MAYA SARDESAI** **Dr. John Yoo**

9:30 – 10:00 **Dr. Maya Sardesai** Unilateral Vocal Cord Paralysis: The State of the Art

10:00 – 10:05 **Interactive Discussion**

10:05 – 10:15 **Dr. Hussain Alsaffar** Soft Palate Implants for Primary Snoring – A Prospective Series

10:15 – 10:20 **Interactive Discussion**

10:20 – 10:30 **Dr. Goran Jeremic** Discrepancy between Ultrasonographic and Final Pathology Measurements in Thyroid Nodules

10:30 – 10:35 **Interactive Discussion**

10:35 – 11:15 **COFFEE IN THE EXHIBITORS' AREA**

11:15 – 11:25 **Dr. Shahin Nabi** Superiorly-Based Pharyngeal Flap Surgery for Velopharyngeal Insufficiency (VPI): When Do We See an Improvement and Is It Maintained?

11:25 – 11:30 **Interactive Discussion**

11:30 – 11:40 **Dr. Mohamed Mohamed** Analysis of Human Tissue Kallikrein Expression in Salivary Gland Tumours

11:40 – 11:45 **Interactive Discussion**

11:45 – 11:50 **INTRODUCTION OF DR. JONAS JOHNSON** **Dr. John Yoo**

11:50 – 12:20 **Dr. Jonas Johnson** The Importance of Surgery in the Evolving Era of Chemoradiation Treatment for Head and Neck Cancer

12:20 – 12:25 **Interactive Discussion**

12:25 – 1:30 **LUNCH**

CHAIRMAN – DR. COREY MOORE

1:30 – 1:45	Presentation of Awards	
1:45 – 1:55	Dr. Amanda Hu	Evaluation of a Three-Dimensional Educational Computer Model of the Larynx: Voicing a New Direction
1:55 – 2:00	Interactive Discussion	
2:00 – 2:10	Dr. Leigh Sowerby	Development and Face Validity Testing of a Three Dimensional Myringotomy Simulator with Haptic Feedback
2:10 – 2:15	Interactive Discussion	
2:15 – 2:25	Dr. Michael Brandt	A Prospective Evaluation of Perioperative Concerns Amongst Patients Undergoing Otorhinolaryngologic Procedures
2:25 – 2:30	Interactive Discussion	
2:30 – 2:40	Dr. Irene Zhang	Role of the Teres Major Muscle in Donor Site Morbidity Following Osteocutaneous Scapular Free Tissue Transfer – Evaluation of an Unconventional Method of Donor Site Closure
2:40 – 2:45	Interactive Discussion	
2:45 – 2:55	Dr. Scott Hamilton	Cisplatin Otoprotection Using Transtympanic L-N Acetylcysteine
2:55 – 3:00	Interactive Discussion	
3:00 – 3:10	Dr. Damian Micomonaco	A Double Blinded Prospective Randomized Control Trial Investigating the Effects of Autologous Plasma Adhesives on Wound Healing and Aesthetic Outcome of Area Scars
3:10 – 3:15	Interactive Discussion	
3:15 – 3:30	Evaluation Form Completion	

SOFT PALATE IMPLANTS FOR PRIMARY SNORING: A PROSPECTIVE SERIES

Dr. Hussain Alsaffar

BACKGROUND: Multiple options are available for the treatment of primary snoring. Our objective was to evaluate a palatal implant system in the treatment of primary snoring caused by retrovelar collapse in individuals without obstructive sleep apnea.

STUDY DESIGN: Prospective long-term study comparing snoring outcomes pre- and post- soft palate implantation.

METHOD: Snoring patients without sleep apnea were offered palatal implantation after assessment via strict inclusion/exclusion criteria. Snoring severity was rated by the bed partner, in a longitudinal fashion, using a Snoring Scale both in the pre-operative and post-operative setting. Paired-Student's t-tests was used comparing the mean Snoring Scale values preoperative and at different points of time post operative up to one year, and to compare patient's body mass indices as possible confounders.

RESULTS: Data were obtained from 25 patients over a follow-up time of one year, for a total of (75) implants. A statistically and clinically significant improvement in the Snoring Scale was noted over the 52 week time period of the study in our patient population (mean pre-op score = 9.5, mean post-op score = 5.5, $p < 0.001$). Body mass index was not a significant confounder of the data.

CONCLUSION: Soft palate implantation is a safe and effective technique for achieving a subjective improvement in the intrusiveness of primary snoring as noted by the bed partner.

PREVALENCE OF TRISMUS IN HEAD AND NECK CANCER PATIENTS TREATED WITH RADIOTHERAPY

Dr. Goran Jeremic

BACKGROUND: Head and neck cancer patients treated with radiotherapy have long-term morbidity that can lead to significant quality of life issues. Radiation can have adverse effects on surrounding normal structures including the muscles of mastication, which can lead to muscle spasms, cramping, and oromandibular dystonia. Severe fibrosis and soft tissue contracture can result in trismus.

OBJECTIVE: To determine the prevalence of trismus in head and neck cancer patients treated with radiotherapy.

METHODS: Cross-sectional observational study.

STUDY POPULATION: Previously radiated head and neck cancer patients.

OUTCOME MEASURES: Mandibular Function Impairment Questionnaire - subjective measure of symptoms and impact on quality of life. Mouth opening will be quantified by measuring maximal vertical distance (MVD), maximal protrusion (MP), and maximal lateral distance (MLD), and reflecting this as a mobility index. Variables analyzed will include age, gender, tumor site, radiation field, and time post-treatment.

RESULTS: Pending.

SUPERIORLY-BASED PHARYNGEAL FLAP SURGERY FOR VELOPHARYNGEAL INSUFFICIENCY (VPI): WHEN DO WE SEE AN IMPROVEMENT AND IS IT MAINTAINED?

Dr. Shahin Nabi

OBJECTIVES: To evaluate speech outcomes and timeline to improvement in VPI patients treated with superiorly-based pharyngeal flaps.

METHODS: Retrospective review of all forty patients with VPI receiving a first time superiorly-based pharyngeal flap by one surgeon from 2004-2008. Diagnosis was made via speech assessment, multi-view videofluoroscopy and nasopharyngoscopy in a multi-disciplinary VPI clinic. Data were collected pre- and postoperatively. The primary outcome was the ACPA perceptual evaluation (hypernasality, hyponasality and nasal air emission). The secondary outcome was nasometry (SNAP test).

RESULTS: The initial postoperative visit showed that superiorly-based pharyngeal flaps achieved improvement of hypernasality from preoperative measures ($p < 0.0001$). Significant reductions in nasal air emission were also noted in the pre- and initial postoperative comparisons ($p < 0.0001$). No differences were noted in hyponasality measures in the same period. No significant differences in hyper- or hyponasality or nasal airway emission were observed between the first and second postoperative measures. Analysis of the nasometry data also indicated significant postoperative reductions in nasal airflow consistent with the perceptual assessments.

CONCLUSION: Superiorly-based pharyngeal flaps are the workhorse for VPI treatment in patients with palatal dysfunction/incompetence. These results indicate that improvement occurs early after surgery and is maintained on subsequent visits.

ANALYSIS OF HUMAN TISSUE KALLIKREIN EXPRESSION IN SALIVARY GLAND TUMOURS

Dr. Mohamed Mohamed

OBJECTIVE: To analyze the expression of KLK6,7,8,10,13,14 in selected salivary gland tumours.

DESIGN: A standard immunoperoxidase staining technique was used to semi-quantitatively assess the immunohistochemical expression (IE) profile in normal salivary glands and three types of salivary gland tumours: Pleomorphic Adenoma (PA; n=19), Adenoid Cystic Carcinoma (ACC; n=14), and Mucoepidermoid Carcinoma (MEC; n=10 and normal salivary gland; n=6). Clinical parameters including tumour stage, tumour grade, patient age at diagnosis, gender and site of tumor occurrence were obtained from medical charts and pathology reports. These clinical parameters were individually correlated with KLK6,7,8,10,13,14 levels.

RESULTS: The result of this study showed KLK 6 expressed as strikingly lower level in pleomorphic adenoma, KLK6,7 significantly higher in minor than major salivary gland. There were no statistically significant associations between levels of KLK and tumour stage, tumour grade, patient age, or gender.

CONCLUSION: Kallikrein may be a promising new biomarker in SG tumors. Further studies are needed to quantitatively measure its expression and to correlate it with prospective clinical data.

EVALUATION OF A THREE-DIMENSIONAL EDUCATIONAL COMPUTER MODEL OF THE LARYNX: VOICING A NEW DIRECTION

Dr. Amanda Hu

OBJECTIVES: To evaluate a novel method of teaching laryngeal anatomy.

DESIGN: Prospective, randomized, controlled trial.

SETTING: University educational program.

METHODS: Computer Model Development - A three-dimensional, educational, computer model of the larynx was created from high-resolution computed tomography and magnetic resonance images of cadaveric necks using segmentation software (Amira ®). E-learning authoring software (Articulate ®) then was used to make the model interactive and multimedia. The model was launched on a web-based platform.

Model Evaluation – One hundred students (age 23.8 ± 2.2 years, 55% male) were randomized to either the Three-Dimensional Computer Model group (3D Group) (n=50) or the Standard Written Instruction group (SWI Group) (n=50).

Main outcome measures: Primary outcome measure was the score on a 20-question laryngeal anatomy test; secondary outcome measure was a student opinion questionnaire.

RESULTS: Mean score on the laryngeal anatomy test was 14.2 ± 2.8 (72.0 ± 15.1%). Mean score for the 3D group was 13.6 ± 3.0 (67.0 ± 16.1%) versus 14.8 ± 2.5 (76.0 ± 12.7%) for the SWI Group ($t = 2.194$, df, 98, $p < 0.031$). A majority of students felt that the three-dimensional model was effective, clear, user-friendly, and a preferred supplement to traditional methods of instruction. The 3D group rated the computer model more enjoyable than the SWI group.

CONCLUSIONS: A three-dimensional, educational computer model of the larynx was not shown to be superior to written lecture notes in its efficacy in teaching anatomy; however, it was judged to be a preferred and valuable supplement to traditional teaching methods.

DEVELOPMENT AND FACE VALIDITY TESTING OF A THREE DIMENSIONAL MYRINGOTOMY SIMULATOR WITH HAPTIC FEEDBACK

Dr. Leigh Sowerby

INTRODUCTION: Considerable progress has been made in the development of three dimensional (3D) temporal bone virtual reality simulators. However, very little attention has been paid to interactive simulation of middle ear surgery, including myringotomy. As the development of technical skills for middle ear surgery has a steep learning curve, this poses inherent risks to patients during the skills acquisition phase. The benefit of simulation training in the acquisition of surgical skills has been demonstrated with previous low-fidelity models. Tactile sensation is an important feedback mechanism in middle ear surgery and, as such, a 3D virtual reality myringotomy simulator with haptic feedback was developed at the University of Western Ontario.

OBJECTIVE: To examine the face validity of a 3D myringotomy simulator with haptic feedback.

METHODS: The 3D myringotomy simulator was calibrated with input from two otolaryngologists and one intermediate level resident. The face validity of the resulting simulator was tested by four staff otolaryngologists and seven intermediate/senior level residents using a previously validated questionnaire.

RESULTS: Results demonstrate a good-to-excellent face validity for the myringotomy simulator with high consistency between participants with a Cronbach's alpha of .919. Favourable responses predominated for all questions with the exception of force feedback, where the average response was neutral.

CONCLUSIONS: The initial results from the development and testing of a 3D virtual myringotomy simulator with haptic feedback are very encouraging. This simulator is the first of its kind, and with further refinement, has excellent potential to be of benefit in the training of proficient middle ear surgeons.

A PROSPECTIVE EVALUATION OF PERIOPERATIVE CONCERNS AMONGST PATIENTS UNDERGOING OTORHINOLARYNGOLOGIC PROCEDURES

Dr. Michael Brandt

OBJECTIVES: Patients considering surgery face many uncertainties and concerns. The goal of this investigation was to develop an objective assessment tool for characterizing the areas of greatest concern amongst patients undergoing common Otorhinolaryngologic procedures.

METHODS: Patients undergoing two common Otorhinolaryngologic procedures were evaluated. These patients included those considering hemi-thyroidectomy for indeterminate fine needle aspiration biopsy, and patients undergoing endoscopic sinus surgery for chronic rhinosinusitis. 30 patients in each group were voluntarily recruited to complete a novel questionnaire addressing specific perioperative concerns to their respective surgery. Each participant completed one of three randomized versions of the questionnaire during their initial clinical visit and again 3-days later. Outcomes included descriptive statistics and test-retest reliability.

RESULTS: Top areas of concern amongst the thyroid group included the risk of: cancer, a surgical complication, a change in voice, and the need for an additional operation. The greatest concerns amongst the rhinosinusitis group included: undergoing an anesthetic, not having the problem corrected by the primary surgery, and surgical waiting times.

CONCLUSIONS: Patients considering Otorhinolaryngologic procedures have concerns specific to their diagnosis and prospective surgery that remain stable in the initial preoperative period. These concerns may include factors not commonly addressed in perioperative counseling. This is the first study to explore preoperative patient concerns, and initially establishes the Western Inventory of Surgical Concern as a means of ensuring adequate patient counseling and a method of evaluating perioperative patient education.

ROLE OF THE TERES MAJOR MUSCLE IN DONOR SITE MORBIDITY FOLLOWING OSTEOCUTANEOUS SCAPULAR FREE TISSUE TRANSFER – EVALUATION OF AN UNCONVENTIONAL METHOD OF DONOR SITE CLOSURE

Dr. Irene Zhang

BACKGROUND: Osteocutaneous scapular free tissue transfer plays an important role in head and neck reconstruction. However, donor site morbidity is a major concern. Based on objective data from a previous study at our center, we postulated that the restrictions found in upper extremity function could be explained by soft tissue fibrosis of the teres major muscle, which is typically reattached to the native scapular bone. We therefore decided to prospectively study a cohort of patients whose donor sites were closed *without* surgically reattaching the teres major muscle to the scapula.

OBJECTIVE: To comprehensively evaluate donor site morbidity following osteocutaneous scapular free flap harvest *without* re-attaching the teres major muscle to the native scapula.

DESIGN: Prospective cohort study with historical controls.

METHODS: All consecutive patients reconstructed with osteocutaneous scapular free flaps between September 2007 and December 2008 were identified from a single tertiary care center. All donor sites were closed using the ‘teres unattached’ approach.

Primary outcome measure - Objective measurements of strength and range of motion of shoulder and neck. Secondary outcome measures - Measurements of functional impact including the Shoulder Pain And Disability Index (SPADI) and Neck Dissection Impairment Index (NDII) instruments. Analysis - Outcomes were compared with historical data using the ‘conventional approach’ for donor site closure.

RESULTS: Thirteen patients were identified using the ‘teres unattached’ technique. Complete data sets were obtained in 4 patients in this cohort and 5 patients in the control ‘teres re-attached’ group. Significant measurable objective improvements were demonstrated in a number of parameters in the ‘teres unattached’ group including strength and range of motion of the shoulder and neck. These differences were not reflected in the quality of life data, possibly due to differences in follow-up time.

CONCLUSION: The teres major muscle may not need to be re-attached to the native scapula following osteocutaneous scapular free flap harvest. The results of this preliminary study suggest that this alternative method of donor site closure may improve upper extremity function.

CISPLATIN OTOPROTECTION USING TRANSTYMPANIC L-N ACETYLCYSTEINE

Dr. Scott Hamilton

BACKGROUND: Cisplatin is currently one of the most effective types of chemotherapy for a broad spectrum of tumours, however the incidence of ototoxicity is high and often dose-limiting. There is growing evidence that the mechanism of cisplatin ototoxicity is related to the accumulation of reactive oxygen species (ROS). Systemic antioxidants, such as N-Acetylcysteine, may drastically reduce cisplatin-associated hearing loss but clinical use remains impractical due to loss in oncologic effect. Direct delivery of antioxidants to the inner ear in animals has demonstrated a protective effect to hearing without a systemic effect.

PRIMARY OBJECTIVE: To determine the ability of transtympanic N-Acetylcysteine to decrease the sensorineural hearing loss following cisplatin treatment.

PROTOCOL: Patients undergoing high dose cisplatin therapy had transtympanic injection of 2% N-Acetylcysteine into only one ear prior to each dose of chemotherapy. Pre- and post-treatment audiologic evaluations were performed, and hearing loss was compared between the “treatment” and “control” sides.

OUTCOME: 2 out of the 11 patients in the study had significantly less hearing loss in their treated ear only. There was no effect on tinnitus or word discrimination score.

CONCLUSION / POTENTIAL SIGNIFICANCE: This study provides the first human evidence of a potential otoprotectant for patients undergoing cisplatin treatment. For patients receiving systemic cisplatin, intratympanic N-Acetylcysteine may provide hearing protection and may enable more patients to receive therapeutic doses of chemotherapy.

A DOUBLE BLINDED PROSPECTIVE RANDOMIZED CONTROL TRIAL INVESTIGATING THE EFFECTS OF AUTOLOGOUS PLASMA ADHESIVES ON WOUND HEALING AND AESTHETIC OUTCOME OF AREA SCARS

Dr. Damian Micomonaco

OBJECTIVE: To evaluate the effect of autologous plasma adhesive (APA) on wound healing and aesthetic outcome in area scars resulting from radial forearm free tissue transfer and split thickness skin graft donor sites.

METHODS: Patients undergoing radial forearm free tissue transfer and skin graft reconstruction for head and neck cancer resections were randomly assigned to either Group A (APA forearm, saline thigh) or Group B (saline forearm, APA thigh) after inclusion criteria were met. Group A received APA treatment on the surgical bed of the radial forearm donor site before skin grafting, while Group B received APA treatment to the split thickness skin graft donor site. Wound healing and scar aesthetics were evaluated using the Western Scar Index (WSI) at time points 1 week, 3 months, 6 months and 1 year. Standardized digital photographs of the scars were taken at each time point for evaluation using the WSI. Blinded observers including a clinical nurse practitioner, the patients, and non-medical persons conducted scar evaluation.

RESULTS: A total of 33 patients were enrolled in the study. Six patients were withdrawn due to death prior to completion of the study. Therefore, a total of 27 patients are currently enrolled. Fourteen (10 males, 4 females) of these patients have now completed the study, with an additional 9 patients now through the 6-month time point. Of this group, 10 patients were in Group A (PRP forearm, saline thigh) and 13 were in Group B (PRP thigh, saline forearm). Currently 12 naïve observers have evaluated the digital photographs of the forearm scars and 12 observers have evaluated the digital photographs of the thigh scars using the WSI. Early data suggest that APA expedites wound healing resulting in statistically significant improvements in scars based on observer ratings of photographs from 7 days to 3 months and from 3 months to 6 months.

CONCLUSION: Data analysis is currently being conducted. It is our hypothesis that the APA groups will show increased wound healing and better aesthetic outcomes than the control groups, thereby decreasing donor site morbidity.

DISTINGUISHED VISITING PROFESSOR

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Sponsored by Olympus Canada

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Presented for the most outstanding scientific achievement.

Charles A. Thompson Plaque

PETER CHESKI INNOVATIVE RESEARCH AWARD

Presented for the most innovative research.

THOMAS MARTIN GOLDEN THROAT AWARD

Presented for the most eloquent presentation including evaluation of audio-visual aids.

RESIDENT BOOK AWARDS

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

SIMON KIRBY MOST CARING RESIDENT AWARD

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