Department of Otolaryngology - Head and Neck Surgery

THIRTY-SIXTH ANNUAL

RESIDENTS' RESEARCH DAY

Friday, May 14, 2010
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
2010

8:30 – 9:15	**COFFEE IN THE EXHIBITORS' AREA**	
9:15 – 9:20	**WELCOME**	**Dr. John Yoo**

CHAIRMAN – DR. MURAD HUSEIN

9:20 – 9:25	**INTRODUCTION OF DR. JONATHAN TRITES**	**Dr. John Yoo**
9:25 – 9:55	**Dr. Jonathan Trites**	It's the Climb: Finding Fulfillment in Surgery
9:55 – 10:00	**Interactive Discussion**	
10:00 – 10:10	**Dr. Josée Paradis**	Open Versus Endoscopic Septoplasty: A Single-Blinded Randomized Controlled Trial
10:10 – 10:15	**Interactive Discussion**	
10:15 – 10:25	**Dr. Jason Beyea**	Comparison of Hemostase Versus FloSeal in Controlling Bleeding during Endoscopic Sinus Surgery: A Non-Inferiority Randomized Controlled Trial
10:25 – 10:30	**Interactive Discussion**	
10:30 – 11:15	**COFFEE IN THE EXHIBITORS' AREA**	
11:15 – 11:25	**Dr. Hussain Alsaffar**	Virtual Reality Myringotomy Simulation: Tackling Real Time Soft Tissue Deformation
11:25 – 11:30	**Interactive Discussion**	
11:30 – 11:40	**Dr. Goran Jeremic**	Using Photodynamic Therapy as a Neoadjuvant Treatment in the Surgical Excision of Non-Melanotic Skin Cancers: A Prospective Study
11:40 – 11:45	**Interactive Discussion**	
11:45 – 11:50	**INTRODUCTION OF DR. NIKOLAS BLEVINS**	**Dr. John Yoo**
11:50 – 12:20	**Dr. Nikolas Blevins**	Computer Modeling of the Temporal Bone
12:20 – 12:25	**Interactive Discussion**	
12:25 – 1:30	**LUNCH**	

CHAIRMAN – DR. DUNCAN MACRAE

1:30 – 1:45	**PRESENTATION OF AWARDS**	
1:45 – 1:55	**Dr. Leigh Sowerby**	Sleep Apnea, Daytime Somnolence and Idiopathic Dizziness – A Novel Association
1:55 – 2:00	**Interactive Discussion**	
2:00 – 2:10	**Dr. Amanda Hu**	The Early Postoperative Course of Surgical Sleep Apnea Patients
2:10 – 2:15	**Interactive Discussion**	
2:15 – 2:25	**Dr. Mohamed Mohamed**	Quantifying Biological Creep in Minimally Invasive Thyroidectomy Incisions
2:25 – 2:30	**Interactive Discussion**	
2:30 – 2:40	**Dr. Irene Zhang**	Nasal Spray Outcomes after Functional Endoscopic Sinus Surgery
2:40 – 2:45	**Interactive Discussion**	
2:45 – 2:55	**Dr. Michael Brandt**	Validation of a Novel Scale for the Objective Evaluation of Linear Scars
2:55 – 3:00	**Interactive Discussion**	
3:00 – 3:20	**Interactive Discussion – All Topics**	
3:20 – 3:30	**Evaluation Form Completion**	

OPEN VERSUS ENDOSCOPIC SEPTOPLASTY: A SINGLE-BLINDED RANDOMIZED CONTROLLED TRIAL

Dr. Josée Paradis

BACKGROUND:
A deviated septum can be corrected by either a conventional 'open' or endoscopic approach. Controversy exists regarding comparative outcomes between these two techniques. Our objective was to compare the two according to subjective and objective criteria.

STUDY DESIGN:
Prospective single-blinded randomized controlled trial.

METHODS:
Over a six month period all patients diagnosed with a septal deviation meeting strict inclusion/exclusion criteria were recruited. Patients were randomly assigned to either the conventional or endoscopic group. Outcome measures included: surgical time, intra-operative complications, and pre- and post-operative data from the Nasal Obstruction Symptom Evaluation (NOSE) questionnaire. Chi-square and t-tests were used for statistical analyses.

RESULTS:
Sixty-three patients were enrolled in the study: 32 in the endoscopic group and 31 in the conventional group. There were subjective post-operative improvements in the NOSE scores across all participants and within both groups (endoscopic: pre-op mean score = 14.7, post-op mean score = 7.4, $p < 0.05$; conventional: pre-op mean score = 15.2, post-op mean score = 6.3, $p < 0.05$), with no differences found between groups ($p = 0.61$). However, objective outcomes such as operative time ($p < 0.001$) and intra-operative complications ($p = 0.01$) favoured the endoscopic group.

CONCLUSION:
The endoscopic approach for septoplasty may be considered as superior to the traditional approach for the correction of septal deviation.

COMPARISON OF HEMOSTASE VERSUS FLOSEAL IN CONTROLLING BLEEDING DURING ENDOSCOPIC SINUS SURGERY: A NON-INFERIORITY RANDOMIZED CONTROLLED TRIAL

Dr. Jason A. Beyea

OBJECTIVE:
To evaluate the effectiveness of a novel agent (HemoStase) for the control of nasal bleeding during endoscopic sinus surgery. HemoStase is a plant-derived hemostatic agent, which had not previously been used in sinus surgery.

HYPOTHESIS:
The volume of bleeding during endoscopic sinus surgery will not be statistically significantly different between the control group (FloSeal) and the experimental group (HemoStase).

DESIGN:
Randomized controlled clinical trial.

SETTING:
Tertiary care center sinus/rhinology practice.

POPULATION:
Eighteen patients with a history of chronic rhinosinusitis with polyposis who had failed maximal medical therapy and had decided to undergo functional endoscopic sinus surgery (FESS).

METHODS:
Participants were randomized into one of the two groups (control FloSeal group or experimental HemoStase group). Both groups underwent FESS. In the control group, intraoperative actively bleeding sites in the nose were controlled with FloSeal. In the experimental group, intraoperative actively bleeding sites in the nose were controlled with HemoStase.

MAIN OUTCOME MEASURE:
Total operative blood loss. Blood loss was a sum of blood removed by suction during the surgery (recorded in millilitres) and blood on surgical sponges (weighed, converted to millilitres).

STATISTICAL ANALYSIS:
Independent t-test assuming equal variance.

RESULTS:
Bleeding (mL, Mean ± SEM) was not significantly different between the FloSeal (262 ± 15) and HemoStase (265 ± 33) groups ($p=0.93$).

CONCLUSIONS:
The results of this study demonstrate non-inferiority of a novel product for the control of intraoperative bleeding during endoscopic sinus surgery.

VIRTUAL REALITY MYRINGOTOMY SIMULATION: TACKLING REAL TIME SOFT TISSUE DEFORMATION

Dr. Hussain Alsaffar

BACKGROUND:
Virtual reality surgical simulation can enable residents and surgeons to acquire surgical skills and rehearse surgery while minimizing risks to patients. The ability to create simulators with immersive three-dimensional graphics, sound, and haptic (touch) feedback is now possible with the recent increase in computational and graphics processing capabilities. Soft tissue deformation has remained an obstacle in surgical simulation because of the complexity of calculations and the difficulty in obtaining real-time performance.

OBJECTIVE:
- Develop a 3D mass-spring model of the tympanic membrane with the capability of calculating real-time deformations and cutting with surgical instruments
- To compare the three implemented cutting algorithms to assess realism of each algorithm in myringotomy

RESULTS:
- A 3D mass-spring model of the tympanic membrane was created and three soft-tissue cutting models were successfully implemented. Each of these models was capable of calculating deformations and cutting in real-time. The realism of each of these models was assessed and compared using a questionnaire by 8 staff Otolaryngologists and 4 senior residents.

USING PHOTODYNAMIC THERAPY AS A NEOADJUVANT TREATMENT IN THE SURGICAL EXCISION OF NON-MELANOTIC SKIN CANCERS: A PROSPECTIVE STUDY

Dr. Goran Jeremic

BACKGROUND:
Topical photodynamic therapy (PDT) is a successful treatment for non-melanotic skin cancers (NMSC). Nevertheless, surgical excision continues to be the gold standard treatment. Cervicofacial excision often results in functional and aesthetic impairment. We hypothesize that PDT as a neoadjuvant therapy to surgical excision may reduce tumor size and subsequently decrease local morbidity.

OBJECTIVES:
To determine the utility of topical PDT in reducing NMSC area for the purpose of surgical excision.

METHODS:
A prospective cohort study.

RESULTS:
Thirty-three Basal Cell Carcinomas with a mean area of 523 ± 120 mm^2, and twenty-six Squamous Cell Carcinomas with a mean area of 357 ± 61 mm^2 were included. Of these lesions, 22 demonstrated a complete curative response after an average of two PDT treatments that were then confirmed with histologically negative biopsies. The remaining lesions demonstrated a partial response to PDT with a maximum reduction in lesion area following an average of three PDT treatments of at least 88% ($p < 0.05$). These lesions were then excised with clear histologic margins. Follow-up at 6-months for all lesions demonstrated no locoregional recurrence.

CONCLUSIONS:
This is the first study to investigate the efficacy of neoadjuvant topical PDT in the management of NMSC. The results suggest that for NMSC not demonstrating a complete curative response to PDT, neoadjuvant topical PDT can substantially reduce tumor burden allowing for less morbid surgical excisions. A balance can thus be reached between achieving histologic cancer cure and minimizing locoregional morbidity in the functionally and aesthetically sensitive region of the head and neck.

SLEEP APNEA, DAYTIME SOMNOLENCE AND IDIOPATHIC DIZZINESS – A NOVEL ASSOCIATION

Dr. Leigh Sowerby

OBJECTIVES:
To determine if an association exists between sleep apnea, daytime somnolence and chronic idiopathic dizziness.

STUDY DESIGN:
Case-control study of new patients presenting to a tertiary neuro-otologic practice. A total of 46 subjects with idiopathic dizziness (ID), 20 positive controls with dizziness (benign paroxysmal positional vertigo - BPV), and 69 negative controls with hearing loss but no dizziness (HL), were enrolled.

METHODS:
Participants (patients diagnosed with the above conditions and meeting all other inclusion criteria) completed a sleep questionnaire and had a complete physical exam and investigations to establish or exclude a neuro-otologic diagnosis. They were subsequently evaluated for risk of symptomatic sleep disturbance based on the Epworth Sleepiness Scale (ESS), the Berlin Questionnaire, and the Multivariable Apnea Risk Index (MAP). Statisical analysis was carried out using SPSS.

RESULTS:
There was no significant demographic difference amongst the groups in terms of age, sex, body-mass index, neck size, alcohol consumption or smoking. Using a cutoff of both 10 and 12 on the ESS, the ID were more likely to have significant daytime somnolence than the HL group, with a likelihood ratio of 7.8 for the ESS12 score ($p=0.021$) and 7.1 for the ESS10 score ($p=0.029$). Using the MAP score, a statistically significant difference between the ID group and both the BPV group (LR 3.99, $p=0.046$) and the HL group (LR 5.46, $p=0.019$) was found.

CONCLUSIONS:
This study suggests that a previously undescribed link between idiopathic dizziness, daytime somnolence and sleep apnea might exist. Prospective investigation is warranted to determine whether treatment of any sleep issues resolves symptoms of idiopathic dizziness.

THE EARLY POSTOPERATIVE COURSE OF SURGICAL SLEEP APNEA PATIENTS

Dr. Amanda Hu

OBJECTIVES/HYPOTHESIS:
Recent guidelines from the American Society of Anesthesiologists recommended postoperative monitoring for most patients undergoing surgery for obstructive sleep apnea (OSA). These guidelines however are largely based on retrospective literature and expert opinion. The appropriate level of postoperative monitoring remains controversial. Our objective was to prospectively document the early postoperative course of patients undergoing OSA surgery.

STUDY DESIGN:
Prospective observational study.

METHODS:
One hundred and twenty-one patients (age 43.92±13.46 years, 79.8% male) with sleep-study proven OSA (AHI 31.85±22.66) who were undergoing surgery for OSA at our tertiary care centre were recruited from 2007 to 2009. Outcome measures were: 1) Incidence of respiratory complications requiring nursing intervention. 2) Level of postoperative blood oxygen saturation, divided into three groups: a) mean oxygen saturation in recovery room (SpO2recovery), b) mean oxygen saturation in step-up unit (SpO2step-up), and c) lowest oxygen saturation over the 24 hour period (SpO2minimum). These results were then compared to the benchmark literature.

RESULTS:
Overall incidence of nursing intervention in response to a respiratory complication (3.4%) was significantly less than expected ($p < 0.001$-0.002). SpO2recovery was 92.85±3.21%, SpO2step-up was 95.94±1.56%, and SpO2minimum was 92.77±3.07%. No variables were identified as being associated with any of the outcomes measures.

CONCLUSIONS:
Incidence of respiratory events requiring intervention in the early postoperative course of OSA patients was low (3.4%). Routine postoperative inpatient monitoring may not be required in many cases.

QUANTIFYING BIOLOGICAL CREEP IN MINIMALLY INVASIVE THYROIDECTOMY INCISIONS

Dr. Mohamed Mohamed

BACKGROUND:
Biological creep is a well known phenomenon and this process is utilized for intra-operative tissue expansion. There is a trend toward minimally invasive thyroidectomy, however, the size of the thyroidectomy incision is limited by the short axis of the dominant nodule. Minimally invasive thyroidectomy is associated with significant retraction and therefore biological creep might be expected and therefore an incision smaller than the short axis could potentially be used.

PRIMARY OBJECTIVE:
To quantify biological creep in minimally invasive thyroidectomy incisions.

SECONDARY OBJECTIVE:
To quantify the recovery from the biological creep throughout the healing process.

METHODS:
Prospective analysis of 50 consecutive thyroidectomies performed by a single surgeon. Patient demographics, thyroid ultrasound, and surgical data was accrued prospectively. Thyroid incision length was documented at the onset of the surgery, as well as at the completion of surgery, as well as at 3 and 6 weeks post-operatively.

RESULTS:
1 - A multiple regression analysis was conducted to predict Creep using length of surgery and initial length of incision. The equation significantly predicted creep and explained over 39% of the variance in Creep (R^2=.399, F(2,34)=11.29, p<.001).

The equation: C`=0.969+0.005 (L of surg)-0.216 (Init. Incision)

2 - More creep in longer surgery and small incision. No association between creep and age, volume of gland, sex, BMI, or type of thyroidectomy.

NASAL SPRAY OUTCOMES AFTER FUNCTIONAL ENDOSCOPIC SINUS SURGERY

Dr. Irene Zhang

OBJECTIVE:
To compare the effects of three nasal spray regimens after functional endoscopic sinus surgery for chronic rhinosinusitis with polyposis.

METHOD AND DESIGN:
A prospective randomized control trial in tertiary referral center. All patients who met the inclusion criteria were randomized into three arms: normal saline rinse, normal saline followed by Budesonide, and normal saline with Budesonide mix. Outcome measurements were: QOL SNOT scores, Lund-MacKay CT staging system, Lund-MacKay endoscopic scoring system, intraocular pressure and ACTH. Data were collected at baseline, 6 month and 1 year post op.

RESULTS:
There is no statistical difference between three different nasal saline regimens in disease recurrence, complication and QOL outcomes.

CONCLUSION:
Budesonide nasal spray does not have added benefit to normal saline spray post FESS in disease recurrence and QOL outcomes.

VALIDATION OF A NOVEL SCALE FOR THE OBJECTIVE EVALUATION OF LINEAR SCARS

Dr. Michael Brandt

OBJECTIVES:
In order to determine the efficacy of interventions to improve and monitor skin scarring, a valid assessment instrument must be used. Validity requires that a tool accurately and reliably reflects the domains it seeks to measure. The validity of existing scar scales have previously been brought into question based on inherent mathematical limitations. In an effort to find a valid means of evaluating skin scarring, this study developed a novel tool for the objective evaluation of skin scars.

METHODS:
A three-phase approach was undertaken for the development and preliminary validation of this novel scar evaluation scale. The first phase consisted of establishing construct and content validity. This was followed by a second phase, which involved the generation of the scar scale and preliminary testing. The final phase employed the use of novel, proprietary computer evaluation software to assist in the measurement of internal reliability and consistency. Outcomes included descriptive statistics, intra- and inter-rater reliability.

RESULTS:
Thirty individuals completed over 11,000 measurements using a novel scar evaluation scale – the Scar Camouflage Scale (SCS). Preliminary data demonstrate strong intra-rater consistency and between-rater reliability. Study participants found the testing software intuitive and straightforward.

CONCLUSIONS:
Through rigorous methodology, this investigation provides preliminary support for the establishment of the Scar Camouflage Scale (SCS) as an accurate tool for the objective evaluation of linear scars. These results provide the empirical basis for further validity testing – with the ultimate goal of standardizing methods to quantify skin scarring.

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AWARDS & PRIZES

SCIENTIFIC ACHIEVEMENT AWARD:

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

Presented to the resident who demonstrates excellence in compassionate care.

UNDERGRADUATE TEACHING AWARD

Sponsored by Alcon Canada Inc. and presented to the resident with the highest teaching evaluation.