13:10 - 13:22

Differential Expression of TGF-B in Benign vs Papillary Thyroid Cancer Nodules; A Potential Diagnostic Tool? – M. Brace, Dalhousie University

M. Petten, F. Makki, M. Taylor, J. Trites, M. Bullock, J. Wang, R. Hart, Halifax, NS

Objective: To compare the expression of transforming growth factor β (TGF- β) in malignant and benign thyroid nodules. Methods: From 2008-present, thyroid nodule tissue from thyroidectomy specimens was prospectively collected and stored at -80°C. RNA extraction and reverse transcription was performed on 47 samples (24 papillary thyroid cancer and 23 benign nodules). Quantitative PCR using SYBR green was performed to detect TGF-β-1 and -2. Resulting CT values were normalized against β-actin. Gene expression was calculated using the 2-ΔCT method. Results: A significantly greater expression of TGF- β1 was detected in the group of malignant thyroid nodules compared to benign nodules. There was no difference in the expression of TGF- β2 between the two groups. Conclusions: We demonstrated that expression of TGF- β1 but not TGF- β2 is significantly increased in papillary thyroid cancer compared to benign thyroid nodules. This may serve as a potential diagnostic marker for papillary thyroid cancer.

13:22 – 13:34

Association between Allergic Rhinitis and Asthma in an Northern Alberta Cohort (ARANAC): A Population-based Study – C.C. Jeffery, University of Alberta

M. Bhutani , H. Vliagoftis , E. Wright, D. W. Côté, Edmonton, AB

Objective: The goal of this study is to identify the prevalence of undiagnosed asthma and reactive airway disease in a population of patients referred to tertiary care Rhinology with allergic rhinitis. Study Design: Prospective study. Methods: Patients presenting with symptoms of allergic rhinitis to two tertiary care Rhinologists were asked to undergo allergy skin testing, serum IgE quantification, and pulmonary functional testing. Patients with previous asthma screening or known history of reactive airway disease or asthma were excluded. Results: 102 patients with allergic rhinitis symptoms were recruited between 2011 to 2012. Patients predominantly had perennial rhinitis (59.8%) with moderate – severe symptoms (50%). While only 20.8% of patients had abnormal IgE levels, 69.2% had positive skin testing. Abnormal pulmonary function tests were obtained in 35.1% of patients and 24.5% of patients were diagnosed with asthma. Conclusions: There is a high prevalence of undiagnosed asthma in patients presenting to tertiary Rhinology care with allergic rhinitis symptoms. Significance: This study raises the possible benefit of asthma screening in this population.

13:34 – 13:46

Predictive Value of Hemotoxylin and Eosin Staining in Determining p16 Positivity in Oropharyngeal Cancer – T. Cooper, University of Alberta

V. Biron, L. Puttagunta, H. Seikaly, Edmonton, AB

Objectives: To report on the utility of hematoxylin and eosin (H&E) staining in predicting p16 positivity in oropharyngeal cancer. Methods: Cross-sectional diagnostic accuracy study. Tissue microarrays were generated from 226 oropharyngeal tumor specimens stained with H&E and immunohistochemical markers. Samples were scored by a blinded pathologist for basaloid differentiation, keratinization, and p16 positivity. Multivariable statistical analysis was performed. Results: Of the 226 samples, 112 were p16 positive and 20 had basaloid differentiation. The PPV of basaloid differentiation for p16 positivity was 85% and the NPV was 54%. Sensitivity and specificity were 15 and 97% respectively. In samples identified as basaloid, the positive LR for p16 positivity was 5. Keratinization was also associated with p16 negativity ($p < 0.002$). Conclusions: The identification of basaloid differentiation on initial H&E staining is highly predictive of p16 positivity and could be used as a surrogate marker for HPV positivity. These findings have significant cost savings implications.

13:46 – 13:58
A Prospective Study of the Effect of Tension Tape Tissue Expansion on Radial Forearm Skin Pliability – J. Chung, University of Ottawa
J. P. Bonaparte, M. Odell, M. Corsten, Ottawa, ON

Objectives: This study tested the hypothesis that tissue expansion with tension tapes would result in an increase in forearm skin pliability (maximal skin stretch under a given suction load) in patients undergoing radial forearm free flap surgery. Methods: Tension tapes were applied across the forearm one week preoperatively. Immediately prior to surgery, the skin pliability of the dorsal and volar sites were measured with the Cutometer on both the treatment and contralateral (control) arms. Twenty-four patients were enrolled and the paired t-test was used, with $p = 0.025$ defined as statistically significant. Results: There was an increase in pliability of 7% ($p = 0.018$) on the dorsal site between treatment and control arms (mean 0.73 vs 0.68, sd = 0.13). In contrast, volar site did not show a statistically significant difference between treatment and control. Conclusions: Pre-operative tension tape skin expansion increased skin pliability, primarily in the dorsal forearm.

13:58 – 14:10
Role of Neuroprecursor Cells and Self-assembling Scaffolds in Nerve Regeneration – X. Zhao, University of Toronto
G. Liu, Y. Liu, J. Wang, K. Satkunendrarajah, M. Fehlings, Toronto, ON

Objective: Cranial nerve injury involves loss of central neural cells in the brain stem and surrounding support matrix, leading to severe functional impairment. Therapeutically targeting cellular replacement and enhancing structural support may promote neural regeneration. We examined the combinatorial effect of neuroprecursor cell (NPC) and self-assembling peptide (SAP) administration on nerve regeneration. Methods: CNS injury was induced by clip compression of the rodent spinal cord. SAPs were injected immediately into the injured cord and NPCs at 2 weeks post-injury. Behavioral analysis was done weekly and rats were sacrificed at 11 weeks post injury. Immunohistochemistry was conducted to examine for inflammation, gliosis, axonal preservation, and cell proliferation. Results: NPCs were found to co-localize with SAPs by immunofluorescence. Behavioral analysis showed that SAP + NPC transplantation significantly improved locomotor score compared to control at 4 to 8 weeks post-transplantation. Conclusion: Combinatorial NPC and SAP injection may enhance neural repair and regeneration.

14:10 – 14:22
Prospective Cost-effectiveness Analysis of Implementation of a Post-operative Clinical Care Pathway in Head and Neck Surgery with Microvascular Reconstruction – J. F. Dautremont University of Calgary
J. Yeung, T. Asante, S. Nakoneshny, M. Hoy, S. Chandarana, T.W. Matthews , L.R. Rudmik, C. Schrag, J.C. Dort, Calgary, AB

Objectives: To determine the cost effectiveness of implementation of a post-operative clinical care pathway for patients undergoing head and neck oncologic surgery with microvascular reconstruction. Methods: A prospective trial comparing a treatment group managed under a post-operative clinical care pathway and a historical group managed prior to implementation. Effectiveness outcomes evaluated were total hospital days, return to OR, readmission to ICU and rate of pulmonary complication. Costs were calculated using a time-driven activity based micro-costing technique. Results: 115 patients were included in the study. All outcomes demonstrated that the post-pathway group was both more effective and less costly thus being a dominant clinical intervention (quadrant II of the cost-effectiveness plane). The incremental cost reduction per patient was $4,915.24. Conclusion: Post-operative care pathways significantly improve key clinical outcomes while reducing cost in patients undergoing head and neck oncologic surgery with reconstruction. The widespread implementation of this cost-effective pathway is recommended.

14:22 – 14:34
Scanning Electron Microscopy of Corrosion Casts of the Subglottis following Ischemia Due to Endotracheal Tube Injury: A Pilot Study – L. Kus, University of Toronto
J. Negandhi, M. Estrada, R. Harrison, P. Campisi, V. Forte, E. Propst, Toronto, ON

Objective: To determine the contribution of vascular injury to subglottic ischemia following endotracheal tube injury. Methods: A Yorkshire piglet was intubated, subjected to elevated endotracheal tube cuff pressure in a hypoxic model, and casted by perfusing methyl methacrylate into its blood supply. The overlying tissue was corroded and the resulting vasculature was imaged using scanning electron microscopy. Images of the injured subglottis were compared with those from a control piglet and evaluated for hypoxic and degenerative features (extravasations, corrugations, circular constrictions, interrupted branches). Results: Animals subjected to subglottic injury demonstrated more hypoxic features compared with controls with respect to extravasations per vessel (0.145 vs. 0.015, p<0.0001) and interrupted branches per vessel (0.348 vs. 0.186, p<0.0001). No significant differences were noted with respect to corrugations and circular constrictions across groups (p=0.06, p=0.37, respectively). Conclusions: Vascular injury may contribute to subglottic ischemia following endotracheal tube injury in this accelerated hypoxic animal model.

14:34 – 14:46
CO2 Laser versus Cold Steel Margin Analysis Following Endoscopic Excision of Glottic Cancer – F. Makki, Dalhousie University
M. Rigby, M. Bullock, R. Hart, T. Brown, J. Trites, M. L. Hinni, S. M. Taylor, Halifax, NS

Objectives: To compare CO2 laser and steel instruments for margin excision and analysis in laryngeal transoral laser microsurgery. Methods: Prospective randomized blinded study. Patients with glottic cancer undergoing laser resection were randomized to margin excision by either steel instruments or CO2 laser. Margins were analysed for size, interpretability and degree of artifact by a pathologist

who was blinded to technique. Results: 45 patients were enrolled in the study with 226 total margins taken. 39 margins taken by laser had marked artifact and 0 were un-interpretable. 20 margins taken by steel instruments had marked artifact, and 2 were un-interpretable. Controlling for margin size, the laser technique was associated with increasing degree of margin artifact (p=0.010), but there was no difference in rates of un-interpretability (p=0.24). Conclusion: Laser margin excision is associated with a greater degree of artifact than steel instrument excision, but was not associated with higher rate of un-interpretability.

14:46 – 14:58
Development of a Ototoxicity Model in the Adult CBA/CaJ Mouse and Determination of a Golden Window of Corticosteroid Intervention for Otoprotection – V. Fernandes, University of Toronto
V. Lin, Toronto, ON

Objectives: To develop an ototoxicity model in CBA/CaJ mice, and to determine whether the otoprotective effect of steroids depends on timing of administration. Methods: CBA/J mice were injected with kanamycin(1mg/g)/furosemide(0.5mg/g). Randomized subgroups of 5-7 mice were treated with systemic dexamethasone (0.1mg/g) at timepoints (-1;+1;+6;+12;+72 hours) following ototoxin insult. A control group received no dexamethasone. One week after ototoxic administration, temporal bones were dissected and whole Organ of Corti specimens underwent immunohistochemical processing. Hair cells (HC) were measured from confocal microscope images. Results: Complete HC loss occurred in basal and apical segments of controls. Analysis of steroid recovery suggests a preservation effect on some HCs, but no significant trend based on timing of steroid intervention was noted. Conclusion: We demonstrate a single-timepoint murine model to induce complete HC loss. Steroid administration reduces HC loss, but the presence of a "golden time period" for steroid administration is not clear from our data.

15:30 – 15:42
Validity of 1-Hour Post-thyroidecotmy PTH Level in Predicting Hypocalcemia – T. N. Le, University of Manitoba
D. Sutherland, P. D. Kerr, Winnipeg, MB

Objective: To validate the use of a single 1-hour post-thyroidectomy parathyroid hormone (PTH) level in predicting the development of hypocalcemia. Study Design: Retrospective review, consecutive series 2008-12 Method: Our group previously published a prospective study in which we demonstrated that a single PTH level falling into the low normal range 1-hour post-thyroidectomy was highly predictive for the development of clinically significant hypocalcemia. In this validation study we used a postoperative PTH of less than 12 pg/ml (normal 7-50 pg/ml) as the threshold for selectively starting calcium and vitamin D supplementation immediately postoperatively.   Results: This simple test offers the sensitivity required to safely employ selective calcium and vitamin D supplementation. Early identification of patients requiring supplementation facilitates safe, early discharge. Conclusions: A single 1-hour post-thyroidectomy PTH level is a very good predictor of hypoparathyroidism. Complex protocols requiring multiple calcium and PTH measurements are not required to guide post-thyroidectomy management.

15:42 – 15:54
An in Vivo Study of a Novel Composite Hyaluronic Acid and Gelatin Hydrogel to improve healing of Vocal Fold Scars in a rat Model – Y. Alghonaim, McGill University

L. Mongeau, S. Daniel, Montreal, QC

Objectives: To investigate the healing potential of our novel hierarchically micro-structured Hyaluronic Acid (HA)-gelatin hydrogel in the treatment of acute vocal fold injury using a rat model. Methods: Vocal fold injury was performed unilaterally in 144 rats. The animals were radomized into 3 groups. Each group, had 25 µl of either saline, HA bulk or HA-gelatin hydrogel was injected into the lamina propria five days after injury. Vocal folds were harvested at days 3, 14, 28 and 56 days after injection and were analyzed using histology and immunohistochemistry. Results: Staining for macrophages, myofibroblasts, collagen type I, and elastin revealed important differences between the HA-Ge and the saline groups. Compared to the HA-gelatin group, the macrophages count was significantly higher in the saline group (p<0.05). Myofibroblast counts were statistically insignificant in all groups. Four weeks post-injection, collagen type I was significantly higher in the HA-bulk and HA-gelatin groups than in the saline group (p<0.05). Conclusions: Local HA-gelatin injection did not show distinguishable tissue remodeling and did not cause an inflammatory response during the time course of this study.

15:54 – 16:06
Intraoperative Parathyroid Hormone Level During Parathyroidectomy: Which Patients Benefit From It? – F. Zawawi, McGill University
A.M. Mlynarek, A. Cantor, R. Varshney, M. Hier, M. Black, R.J. Payne, Montreal, QC

Background: Intraoperative parathyroid hormone levels (IOPTH) are routinely drawn during parathyroidectomy to confirm the success of the procedure. IOPTH adds up to 1 hour to the surgery. The purpose of this study is to determine whether IOPTH is necessary for all patients undergoing parathyroidectomy. Methods and Materials: A retrospective cohort review of consecutive parathyroidectomies at 3 university affiliated hospitals. Demographics, radiological test results, PTH and IOPTH, surgical procedures and pathology reports were reviewed. Results: 140 patients had surgery for primary hyperparathyroidism. 25 were excluded due to incomplete data. 101 had a radiologically localized adenoma, 92% of whom were found intraoperatively in that location. IOPTH was not of added value in 97% of the radiologically localized adenomas (p value <0.001). IOPTH added an estimate of 34 min on average to surgery. Conclusion: This study demonstrates that the added operating time associated with IOPTH may not be justified for patients undergoing parathyroidectomy for a radiologically localized adenoma as it benefits only 3% of these patients.

16:06 – 16:18
High Definition Video Teaching Module for Learning Neck Dissection – **A. Mendez, University of Alberta**
H. Seikaly, K. Richardson, D. Cote, Edmonton, AB

Introduction: Video teaching modules are proven effective tools for enhancing student competencies and technical skills in the operating room; however, integration into post-graduate surgical curricula continues to pose a challenge in modern surgical education. To date, video teaching modules for neck dissection have yet to be described in the literature. Purpose: To develop and validate an HD video-based teaching model to help instruct post-graduate otolaryngology trainees how to perform a neck dissection. Methods: This prospective, crossover study included 8 otolaryngology residents (PGY3-5). All consented subjects first performed a control level I-IV neck dissection. Subjects were then exposed to the video teaching module. Following a washout period, a repeat procedure was performed. Recordings of both sets of neck dissections were de-identified and reviewed by an independant evaluator and scored with

predefined criteria. Secondary outcomes for knowledge, and subjective scores were also obtained. Results: Preliminary results indicate that following the video teaching module, residents were four times less likely to commit errors and to be more confident in their knowledge of the steps and pitfalls of the procedure. Conclusion: The video teaching module improved resident knowledge onto the surgical steps in performing a level 1-4 neck dissection. Residents were also less likely to perform surgical errors during neck dissection following the module.

16:18 – 16:30
Cytokine Biomarkers as Predictive Tool in the Treatment of Chronic Sinusitis with Leptospermum Honey – A. Thamboo, University of British Columbia
J. Manji, V. Sunkaraneni, A. Habib, C. Garnis, A. Javer, Vancouver, BC

Objectives: To determine whether a change in mucosal cytokine markers in adult patients with chronic rhinosinusitis (CRS) undergoing FESS correlates with clinical response to Leptospermum [Manuka] Honey (LH) and/or nasal saline (NS) sinus irrigations over three months postoperatively. Aim is to determine a cytokine profile for patients suited for LH treatment. Methods: A randomized, single-blinded trial using either LH or NS postoperative nasal irrigation. Levels of 17 cytokines in 82 tissue samples, collected intraoperatively and postoperatively, were compared to blinded, endoscopic clinical scores. Analysis was performed with a permutation non-parametric test and Benjamini and Hochbert method for multiple testing. Results: IL-1b (p=0.003), IL-4 (p=7.29x10-14), IL-6 (p=0.003) and IL-12 (p=2.91x10-14) were significantly upregulated in patients who responded favourably to LH treatment but not in those patients who responded to NS irrigation. Conclusions: Up-regulation of IL-1b, IL-4, IL-6 and IL-12 may predict more favourable postoperative response to LH irrigation in CRS patients undergoing FESS.

16:30 – 16:42
Development of a Prospective Multidisciplinary Database of Clinical, Functional, and Quality of Life Outcomes in Head and Neck Cancer – S. Moubayed, Université de Montréal
L. Guertin, P.-F. Nguyen-Tân, D. Soulères, J. Sampalis, A. Christopoulos, Montréal, QC

Objectives: (1) To identify the clinical and research needs and tools for head and neck cancer outcome collection in a tertiary referral center; (2) To develop and implement an efficient system for outcomes collection. Methods: (1) Consultatory multidsciplinary meetings to evaluate the local needs and currently available tools in terms of head and neck outcomes; (2) Literature review of available outcomes tools; (3) Database development using vOACIS (Sun Microsystems, Inc.) and the SARDO computer systems Results: (1) Clinical data is collected using precise standards by medical archivists using SARDO, and was augmented by implementing systematic p16 and HPV evaluation; (2) Speech, swallowing, and malnutrition (functional outcomes) are evaluated at 0, 3, and 12 months with the PSS-H&N scale, PR-SGA scale, modified barium swallows, BMI, and biochemical data (CBC, albumin, CRP). (3) Quality of life outcomes are evaluated at 0, 3, 12 months with the UWQOL and VHI-10 questionnaires. (4) We have developed a vOACIS module to systematically include and collect this data in a database using medical and paramedical personnel. Conclusions: We identified the needs in terms of head and neck cancer outcomes in our tertiary hospital center, and the tools required to collect such data. We have developed an efficient system to collect such data.

16:42 – 16:54

Molecular Predictors of Regional and Distant Metastases in Oropharyngeal Squamous Cell Carcinoma – B. Barber, University of Alberta

V. Biron, L. Puttagunta, H. Seikaly, Edmonton, AB

Objective: To identify biomarker profiles predictive of regional and distant metastases in oropharyngeal squamous cell carcinoma (OPSCC). Methods: Retrospective cross-sectional study of a prospectively collected oropharyngeal cancer database. Tissue microarray (TMA) were constructed with 226 tumor specimen from advanced-stage OPSCC patients diagnosed from 2002-2009. TMA slides were processed by quantitative immunohistochemistry for p16 (HPV surrogate marker), Epidermal growth factor receptor (EGFR), Ki67, p53 and B-cell lymphoma XL (Bcl-XL). Positivity for these markers was through Aqua scores on quantitative histoplots. Correlations between these biomarkers and metastatic disease was analyzed using multivariate statistics. Results: Patients with p16 positivity, high levels of Ki67 and low levels of p53 had significantly less distant metastases. A subgroup of patients with low EGFR levels had lower distant metastasis regardless of p16 positivity and Ki67 levels. Conclusions: Biomarker profiling of OPSCC tumors may be of benefit to determine patients at risk metastatic disease.

16:54 – 17:06
Association of Two BRM Promoter Polymorphisms with Oropharyngeal Squamous Cell Carcinoma (OSCC) Survival – J. Wang, University of Toronto

O. Espin-Garcia, D. Cheng, D. Chen, S. H. Huang, F.-F. Liu, D. N. Reisman, D. H. Brown, R. W. Gilbert, P. J. Gullane, J. C. Irish, D. P. Goldstein, G. Liu, Toronto, ON

Objectives: BRM is a catalytic subunit of the SWI/SNF chromatin remodeling complex, which regulates gene expression and has been linked to carcinogenesis in multiple tumour types. Two polymorphisms in the promoter region of the BRM gene [BRM -741 and -1321] have been associated with OSCC risk and HPV positivity. The aim of this study was to determine whether BRM polymorphisms are correlated with OSCC survival. Methods: Between 2007-2010, 229 patients with OSCC were prospectively recruited. Whole blood samples were obtained from which genotyping for BRM polymorphisms was completed using two custom-designed Taqman assays. An additive model of genetic inheritance was utilized. Results: Each BRM polymorphism was associated with reduced overall survival [BRM -741: HR 2.04, 95% CI 1.12-3.72; BRM -1321: HR 3.12, 95% CI 1.64-5.93] Conclusions: BRM promoter polymorphisms appear to act as prognostic markers in OSCC.