ABSTRACTS
PODIUM: HEAD AND NECK SURGERY 1
SUNDAY, JUNE 7, 2015 @ 15:30-17:15

Does the Harmonic Scalpel Reduce Blood Loss and OR Time in Patients Undergoing Major Head and Neck Cancer Surgery – D. Fritz, S. Nakoneshny, T.W. Matthews, S. Chandarana, J. Dort, Calgary, AB

Learning Objectives

1. To quantify the impact of the harmonic scalpel on operative time in an RCT.
2. To quantify the impact of the harmonic scalpel on blood loss in an RCT.

Introduction: Major surgery for advanced oral cancer (OSCC) is time-consuming and potentially morbid. Adjuncts that reduce operating time and blood loss are therefore potentially useful. **Objectives:** 1) To evaluate the impact of using the harmonic scalpel on operating time and blood loss in patients undergoing oro-mandibular resection for advanced OSCC. **Methods:** Thirty-six adult head and neck cancer patients with advanced OSCC requiring primary tumor resection with uni- or bi- lateral selective neck dissection located at a single academic tertiary care centre from July 2012 to September 2014 were enrolled in a prospective, randomized controlled trial (www.clinicaltrials.gov NCT02017834). Patients older than 18 years who were able to provide informed consent were eligible. Primary outcomes of interest were: intraoperative blood loss (mL) and operative time (minutes) for the ablative part of the surgery. **Results:** Mean blood loss in the experimental group was 260 mL versus 403 mL in the control group (p=0.08). Two experimental patients were outliers and strongly influenced the results. Blood loss was significantly lower (p=0.02) in the experimental group when the 2 outliers were removed. Mean operative time was 140 min in the experimental group and 159 min in the control group (p=0.2). **Conclusions:** In this randomized controlled trial, blood loss and OR time were not significantly impacted in patients undergoing surgery for advanced OSCC. However, excluding the 2 experimental patients who had extreme blood loss suggests that overall the harmonic scalpel may be of benefit in reducing blood loss, especially for the oral cavity component of the resection.

Efficacy of a Rapid Awakening Protocol (RAP) in Decreasing Length of Hospital Stay and Morbidity in Head and Neck Cancer Patients: A Prospective Study - B. Barber, Edmonton, AB, J. Dort, Calgary, AB, M. Meier, T. Yeh, D. Zygun, D. O'Connell,H. Seikaly, J. Harris, Edmonton, AB

Learning Objectives

1. To determine the effect of a RAP on mechanical ventilation time and length of intensive care unit admission.
2. To assess the effect of RAP on morbidity and intensive care unit re-admissions.
3. To examine the effect of a rapid awakening protocol (RAP) on overall length of hospital stay (LOHS).

Objective: The aim of this study was to optimize an existing head and neck cancer (HNC) clinical care pathway with a rapid awakening protocol to limit mechanical ventilation and determine the effects on morbidity and length of hospital stay (LOHS). **Methods:** All HNC patients undergoing major HNC surgery from June 2014 to October 2014 underwent a RAP involving initiation and maintenance of spontaneous breathing immediately postoperatively, minimization of sedation and mechanical ventilation, and early mobilization by 12 hours postoperatively. This prospective cohort was compared to a historical cohort treated from June 2013 to October 2013 regarding LOHS, duration of ventilation time and ICU admission, and readmissions to ICU. Statistical analysis was completed using a Mann-Whitney analysis and chi-squared analyses. **Results:** 58 patients underwent RAP from June to October 2014. In the 2014 cohort, significantly shorter LOS (14.6 vs. 19.3 days, p=0.03), mean mechanical ventilation time (601.3 vs. 1262.8 minutes, p=0.01), mean duration of ICU admission (1.69 vs. 2.27 days, p=0.02), readmissions to ICU (1.2% vs 15.6%, p=0.004) were recorded. **Conclusions:** Implementation of a RAP in patients undergoing major HNC surgery can allow for decreased LOHS, as well as decreased ICU admission and ventilation time, and decreased ICU readmissions.

Predictors of Failed and Delayed Decannulation After Head and Neck Surgery: A Case-Control Study – A. Isaac, H. Zhang, Edmonton, AB, S. Hamilton, St. John's, NL, D. O'Connell, J. Harris, H. Seikaly, Edmonton, AB

Learning Objectives

1. Describe the success rate of adenotonsillectomy for snoring / sleep disordered breathing in the literature.
2. List the variables that are predictive of success / failure of adenotonsillectomy in children.
3. Discuss strategies to maximize success of adenotonsillectomy in children.

Objective: to determine the variables associated with success of tonsillectomy &/or adenoidectomy (T±A) in otherwise children with snoring /sleep disordered breathing (S-SDB). **Method:** we retrospectively reviewed a prospective database of children (<18 years old) who presented with S-SDB. The inclusion criteria were being otherwise healthy, undergone sleep nasopharyngoscopy (SNP) and T±A, and followed up for a minimum of 3 months. The variables documented included demographics, ethnicity, comorbidities and past medical history (atopy, premature birth, obesity, esophagitis, swallowing dysfunction, neuro-psychiatrist and behavioural disorders), family history (SDB, smoking), and abnormalities on SNP other than enlarged tonsils and or adenoids (chronic rhinitis, deviated nasal septum, pharyngeal collapse, laryngomalacia, tracheomalacia, bronchomalacia). Bi-variable analysis between symptomatic relief as reported by the parents and every independent variable was performed followed by multi-variable logistic regression analysis. **Results:** in 7 years 1591children were treated. 98 syndromic and dysmorphic children were excluded, along with 96 treated with surgeries other than T±A. Finally 332 children satisfied the inclusion criteria. 182 (54.8%) received T±A, 82(24.7%) A, and 68 (20.5%) T), who were followed for 3.7 ± 0.8 months (range 3-7 months). In 235 total relief of symptoms was achieved and 97 remained symptomatic. In bi-variable analysis chronic rhinitis, septum deviation, neuropsychiatric disorder, along with pharyngeal collapse and laryngomalacia were significantly associated ($P<0.05$) with persistence of symptoms. The same variables (except pharyngeal collapse) were predictive of persistent symptoms of S-SDB on regression analysis ($p<0.05$). **Conclusions:** several SNP finding scan predict the requirement of further treatment in children with S-SDB after T±A. Children with history of neuropsychaitric and behavioural disorders may harbor other sleep disorders that render traditional treatment ineffective.

Prospective Evaluation of Neck and Shoulder Function After Unilateral Neck Dissection – T.-H. Low, M. Ehsan, T. Overend, B. Chesworth, D**.** MacNeill, A. Nichols, J. Yoo, K. Fung, London, ON

Learning Objectives

1. To understand the objective and subjective morbidities experienced by the patients after neck dissection.
2. To understand the progression of each of the symptom, both objectively and subjectively, of the 6 month time course.

Background/ Objectives: Neck dissection is commonly performed as part of the surgical treatment for patients with head and neck cancer. Whilst there are many retrospective studies on evaluating the morbidities associated with neck dissection, there is a lack of a prospective evaluation of the morbidities associated with neck dissection. **Method:** This was a prospective cohort study. Primary outcome measures included objective measures (change in strength and range of motion (ROM) in shoulder flexion (SF) and external rotation (ER), as well as neck rotation). Secondary outcome measures included subjective self-reported disability (the Neck Dissection Impairment Index (NDII)). Outcomes were measured at pre-surgery, as well as 1-, 3- and 6-months post-surgery. **Result:** To date, a total of 47 patients were recruited for the study. Of those, 7 were excluded in the analysis as they received bilateral neck dissection. The ROM for SF and ER, as well as neck rotation were significantly reduced after surgery at 1 month (143.8°±17.6 vs 123.2°±4.5 ($p<0.001$), 71.0°±4.9 vs 57.7°±4.2 ($p=0.009$), and 62.0°±2.9 vs 53.9°±3.8 ($p=0.034$) respectively). The strength for SF and ER were also reduced (16.6±7.2 N/m^2 vs 13.9±4.6 N/m^2 ($p=0.087$) and 13.6±4.8 N/m^2 vs 10.6±4.1 N/m^2 ($p <0.001$) respectively). The morbidity on NDII score increased from 16.6±7.6 to 26.2±10.8 post operatively ($p<0.001$). The disability associated with rising above the head persisted at 3 months ($p=0.004$). **Conclusion:** Patients undergoing unilateral neck dissection had decreased strength and ROM after the surgery. The disability was also

significantly increased as measured by NDII, implying the need for further research in shoulder rehabilitation post neck dissection.

Survival Analysis for the Impact of Type 2 Diabetes Mellitus in Head and Neck Squamous Cell Carcinoma – D.J. Lee, A. Foreman, S.-H. Huang, Y. Song, W. Xu, J. De Almeida, M. Guiliani, D. Goldstein, Toronto, ON

Abstract TBA

The Effect of Surgical Site Infection on Hospital Length of Stay After Complex Head and Neck Procedures – S. Johnson-Obaseki, Ottawa, ON, N. Kekre, Natasha, Cambridge, MA, S. **Brode, Toronto, ON, D. Schramm, Ottawa, ON**

Learning Objectives

1. To use the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database to examine the effect of surgical site infection on length of stay for major head and neck procedures
2. To quantify the increased length of stay when patients have a surgical site infection following a major head and neck procedure.

Objective: To use the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database to determine if surgical site infection (SSI) following complex head and neck procedures (CHNP) is associated with increased hospital length of stay (LOS). **Methods:** This was a retrospective cohort study using ACS-NSQIP data (2005-2012). We identified 1126 patients who underwent CHNP, identified as procedures likely to take > 6 hours (laryngectomy with bilateral neck dissections and procedures requiring free tissue transfer; CPD codes: 31360, 31365, 31367, 31368, 31390, 31395, 15758, 20969, 15756). Baseline characteristics were illustrated using descriptive statistics. Kaplan-Meier estimation was used to generate time-to-event curves for time from operation to hospital discharge. To determine the association between SSI and LOS, we used a Cox proportional-hazards multivariate regression model to estimate crude and adjusted hazard ratios and 95% confidence intervals. **Results:** There were 1122 patients included in the analysis (4 patients did not have information on LOS). Of these patients, 67 had an SSI (16.75%). As expected, the median time from operation to hospital discharge was increased for those with an SSI (8 days versus 20 days, $p < 0.0001$). Using our multivariate analysis model, SSI was associated with a significantly increased time from surgery to hospital discharge (HR=0.560, 95% CI [0.432, 0.728], $p<0.0001$). **Conclusions:** After adjusting for appropriate covariates, SSI was associated with significantly increased time from CHNP to hospital discharge. This suggests that hospitals should focus on prevention of SSIs to improve hospital LOS in these patients.

Biomarker Profiles of Advanced Stage Oral Cavity Squamous Cell Carcinoma Correlated with Patient Outcomes – V. Biron, A. Enazzi, L. Puttagunta, D. O'Connell, J. Harris, H. Seikaly, Edmonton, AB

Learning Objectives

1. To discuss the role of biomarkers in predicting outcomes in OCSCC.
2. Demonstrate the role of p16, Ki-67, EGFR, p53 and Bcl-XL in OCSCC.

Objectives: Over 300,000 new cases of oral cavity squamous cell carcinoma (OCSCC) are diagnosed yearly worldwide. OCSCC is molecularly heterogeneous, which is thought to contribute to differences in treatment response between patients who have otherwise similar characteristics. The objective of this study is to examine the role of a combination of important tumor biomarkers in predicting outcomes of patients with OCSCC. **Materials and Methods:** Patient demographics, pathology and treatment information for diagnosed with advanced stage OCSCC between 1998-2010 was obtained from a provincial cancer registry. A tissue microarray was constructed and processed for immunohistochemistry with p16, p53, Bcl-XL, EGFR and Ki-67 antibodies. Additional staining with pancytokeratin and DAPI was used for 3-channel co-localization and quantification of biomarkers in normal vs tumor tissues. Biomarker expression levels were correlated with tumor recurrence, metastases and patient survival. **Results:** Between 1998-2010, 584 patients were diagnosed and treated for OCSCC at a single tertiary care center. Nearly 70 % of these patients presented with advanced stage disease and were retrospectively reviewed for biomarker analysis. P16 positivity was

found in 16.6 % of these tumors but was not predictive of survival. Low levels of Ki-67 was associated with lower survival rates and poorer treatment responses to radiation. Combined EGFR and Ki-67 ratios were also associated with significant differences in survival. **Conclusions:** Biomarkers analysis in advanced stage OCSCC including Ki67 and EGFR may be predictive of patient outcomes. Further prospective studies should be undertaken to examine the role of these biomarkers in selecting optimal treatment regimens.

Integrative Analysis of DNA Methylation and Gene Expression Patterns Throughout the Progression of Oral Squamous Cell Carcinoma – R. Towle, D. Truong, W. Robinson, C. Poh, C. Garnis, Vancouver, BC

Learning Objectives

1. To understand the importance of DNA methylation in oral cancer progression.

Oral squamous cell carcinoma (OSCC) has a dismal 5 year survival rate of ~50%. This is in part due to the inability to differentiate a lesion at risk for progression at the earliest stages of this disease. Analyzing DNA methylation and gene expression patterns in the different stages of this disease, we aim to gain a better understanding of the genes involved in OSCC progression and identify those that may be used as biomarkers or therapeutic targets. Multiple biopsies were obtained from each of ten OSCC patients representing hyperplasia, dysplasia and carcinoma in situ (CIS)/squamous cell carcinoma (SCC). Tissues were microdissected and both DNA and RNA were obtained. Extent of DNA methylation was assessed using the Illumina HumanMethylation27K microarray, and gene expression levels were profiled using the Agilent Human Gene Expression 4x44k microarray. Data from both platforms were integrated and recurrently deregulated genes identified. Numerous genes exhibiting concurrent aberrant DNA promoter methylation and gene expression patterns were identified. We observe recurrent hypermethylation of the promoter region and decreased gene expression of 106 genes in oral dysplasias and 134 genes in the CIS/SCC biopsies. 15 genes were recurrently hypomethylated in the dysplasias and 99 in the OSCC/CIS samples. The role of the top candidate genes in oral tumourigenesis has been evaluated in cell model systems. This is the first report integrating profiles of DNA methylation and gene expression data in various histological stages of OSCC. We give evidence that DNA methylation may be a potential critical mechanism in OSCC progression.

Serum miRNAs and Their Role as Biomarkers for Oral Squamous Cell Carcinoma – C. Dickman, J. Lawson, S. MacLellan, Y. Huang, J. Chen, C. Poh, C. Garnis, Vancouver, BC

Learning Objectives

1. To appreciate the utility of circulating microRNAs as a biomarker for oral cancer.

Background: Individuals with oral cancer have a poor survival rate and a high level recurrence due mainly to the late stage of diagnosis. New methods to address this are required in order to increase survival rates. miRNAs, are a group of small nucleotide molecules, involved in gene regulation that have been linked to tumour suppressing and oncogenic roles in cancer. Circulating miRNA expression profiles have been shown to be useful in delineating healthy individuals from those with various types of cancer. **Objective:** To determine the ability of serum miRNAs to act as a biomarker for oral squamous cell carcinoma. **Methods:** Serum was collected from patients with oral squamous cell carcinoma (OSCC) and oral carcinoma in situ (n=48) as well as demographically matched non-cancer controls (n=51). RNA extracted from the serum samples was profiled using miRCURY LNA Universal RT miRNA PCR panels to assess the expression of 742 miRNAs. A model to distinguish between OSCC/CIS and non-cancer individuals was created using logistic regression on miRNAs included in the model by LASSO analysis. **Results:** Our model was able to achieve a higher than 80% accuracy in differentiating between cancer and control samples by including 18 miRNAs in our model/biomarker. **Conclusions**: We have identified a circulating miRNA signature with utility as an oral cancer biomarker. The analytical approaches described here will have utility for developing similar circulating miRNA biomarkers for other cancer types, as well as recurrent disease.

Targeted Therapeutics: Optimization of a PIK3CA Mutational Analysis Pathway – J.Theurer, E. Winquist, D. Palma, J. Yoo, D. MacNeil, K. Fung, C. Howlett, A. Nichols, London, ON

Learning Objectives

1. To become familiar with the prevalence of *PIK3CA* mutations in HNSCC.

2. To understand the purpose of feasibility studies in clinical trial preparation.

PIK3CA is the only frequently-mutated, directly drug-able oncogene in head and neck squamous cell carcinoma (HNSCC). However, it remains unclear if a molecularly-driven intervention trial can be launched successfully, particularly within a single-institution setting. Objective: To optimize our *PIK3CA* mutational analysis pathway to allow for sufficient pre-operative drug exposure in a future trial examining tumor response to targeted treatment of *PIK3CA* mutations. Methods: Tissue biopsies of consecutive cases of HNSCC were analyzed using real-time polymerase chain reaction (PCR) testing to determine presence of PIK3CA mutations and to examine timeliness of the mutational analysis pathway. Results: 25 of 33 (76%) acquired specimens contained sufficient material for *PIK3CA* mutational analysis. Mean number of working days to achieve *PIK3CA* status for 10 'pilot' specimens was 24.8 WD (SD=6.0 WD; range, 19-38 WD), compared to an average of 15.3 (SD=5.0 WD; range, 9-24 WD) for the subsequent 15 specimens ($p<0.001$, Student's t test). Real-time PCR revealed four *PIK3CA* mutations, for a frequency of 16%. Conclusions: Systems-level optimization efforts resulted in achievement of significantly shorter mutational analysis turnaround times. Further optimization will allow for preoperative targeted *PIK3CA* therapy in the context of a window of opportunity trial.