

Department of Surgery Research Day Abstracts

Presentation order

**Session One: Wednesday April 7,
2021: 8:00 AM – 1:45 PM**

**Session Two: Thursday April 8,
2021: 6 PM- 8:30 PM**

**Session Three: Monday April 12^t,
2021: 6 PM – 8:30 PM**

Wednesday April 7, 2021

Chair: Dr. Sean Christie	Chair: Dr. Glen Richardson
Jordan Eng	Claudia Cote
Riley Bowker	Matthew Biskup
Liam Rappoldt	Mustafa Nadi
Anna Duncan	Francisco Reyna-Sepulveda
David Hodgson	Dylan Quinn
Alexander Clark	Kevin Morash
Johnn Rayes	Lee Changseok
Erica Leck	Caitlin Davis
Mark Hanes	James Larkin
Joel Bierer	Mark MacLean
Ahmed Nassar	Sophia Roy
Abdullah Aldaihani	Matthew Cooper
Natalie Ash	David Forner
	Laure Nolte

ESOPHAGEAL STENT MIGRATION – ARE WE GETTING ANY BETTER AT AVOIDING IT?

Jordan Eng, James Ellsmere, Daniel French

GENERAL SURGERY

BACKGROUND: Esophageal stents have traditionally been used for palliation of malignant dysphagia and are increasingly being utilized in patients with benign pathology. Stent migration is one of the most common adverse events and one of the most common reasons for re-intervention. The goal of this study was to determine the incidence of stent migration and further elucidate factors associated with stent migration.

METHODS: A retrospective chart review was performed for all patients undergoing esophageal stenting for both benign and malignant indications at our institution between May 2008 and November 2018. Patients were excluded from further study if their index stent was not placed at our institution. Statistical analysis was performed using SPSS.

RESULTS: 351 index stents were placed during the study period. The majority were placed for malignant lesions (282/351; 80%). Stent migration requiring re-intervention occurred in 78/351 (22%) patients. There was a statistically significant higher incidence of stent migration in cases where the stent was placed for a benign disease (24/69; 35%) compared to malignant disease (54/282; 19%) ($P = 0.018$). There was no difference in stent migration rate when stents placed in the first half of the study period were compared with stents placed in the second half of the study period (27/133; 20% vs 51/218; 23% ($P = 0.597$)).

CONCLUSION: Stent migration remains a common complication requiring re-intervention. The incidence of stent migration is higher when the stent is placed for a benign condition. There remains a need for improved stent design and/or endoscopic techniques to mitigate the risk of stent migration.

RESIDENT – GENERAL SURGERY PGY 5

SCOLIOSIS FLEXIBILITY CORRELATES WITH POST-OPERATIVE OUTCOMES FOLLOWING GROWTH FRIENDLY SURGERY

Riley Bowker, Kevin Morash, Burt Yazsay, Lindsay Andras, Peter Sturm, Paul Sponseller, George Thompson, Ron El-Hawary

ORTHOPAEDICS

BACKGROUND: There has been insufficient study of the relationship between pre-op flexibility and post-op outcomes for early onset scoliosis (EOS) patients who receive growth friendly surgery (GFS). Our objective was to determine if lower pre-op flexibility will result in less scoliosis correction and a higher risk of post-op complications.

METHODS: This study was a retrospective review of prospectively collected study group data from an international EOS registry. Patients with pre-op flexibility radiographs were identified. Pearson correlations were determined for flexibility vs correction for all patients and were compared between etiologies and between implant types.

RESULTS: 107 patients (14 congenital, 43 NM, 31 syndromic, 19 idiopathic) with mean age 7.1 years at index surgery were identified. Mean pre-op scoliosis for the group was 77°. Mean flexibility of 36% was not different between etiologies. Immediate post-op scoliosis was 46°* with mean correction of 38%. Correction rate was not different between etiologies; however, it was different between devices (MCGR 45%, TGR 40%, VEPTR 14%*). Pearson correlation for flexibility vs correction was fair ($r=0.37^*$). This correlation was observed for idiopathic ($r=0.53^*$) and NM ($r=0.46^*$), but not for congenital or syndromic scoliosis. At a mean of 4.8 years follow-up, 66 patients experienced at least one complication. Risk ratio for developing a complication was 1.58 (1.18-2.11) for patients with pre-op flexibility <30%*. *denotes $p<0.05$.

CONCLUSION: Lower pre-operative scoliosis flexibility was associated with less scoliosis correction and a higher risk of post-op complications in our patient population. EOS patients with pre-operative scoliosis flexibility <30% had a risk ratio of 1.58 (1.18-2.11) for developing a post-operative complication.

MEDICAL STUDENT

ESTABLISHING A PATIENT DERIVED, IN VITRO ORGANOTYPIC SLICE CULTURE OF GBM

Liam Rappoldt, Kim, K. Attwood, C. Taylor, R. Ouellette, J. Roy, Adrienne Weeks

NEUROSURGERY

BACKGROUND: Glioblastoma Multiforme (GBM) is the most common primary malignant brain tumour and has a median survival. To help address the current treatment failures and dismal prognosis of GBM, we propose to utilize a patient derived organotypic culture model of GBM. We have utilized this model to test genetic manipulation via lentiviral transduction and the feasibility of utilizing this model to understand patient derived extracellular vesicles (EVs) for the future use as a GBM biomarker in liquid biopsy.

METHODS: To address this, we have sectioned and cultured patient derived organotypic slices. To determine if these organotypic cultures are amenable to lentiviral manipulation, tissue sections were transduced with far-red fluorescent lentivirus and efficiency determined by confocal laser scanning microscopy (CLSM) and flow cytometry (FC). To determine feasibility as a model for EVs, conditioned culture media (CCM) was analyzed by western blot, nanoparticle tracking analysis, and nanoFlow Cytometry. Matched blood samples were also taken prior to, during, and following surgery for EV analysis.

RESULTS: GBM slices have been maintained in culture retaining viability and lentiviral transduction has yielded far-red fluorescence throughout the slice averaging a transduction efficiency of nearly 20%. The majority of cells expressing iRFP simultaneously expressed GBM marker GFAP. CCM showed EV- sized particles positive for canonical EV markers. Plasma samples from matched GBM patient also showed unique GBM signature compared to healthy individuals and will be compared to EVs from match CCM samples.

CONCLUSION: Utilizing this organotypic slice culture for the study of GBM and GBM EVs will hopefully lead to exciting insights into GBM biology, EVs and utilizing EVs for liquid biopsy.

GRAD STUDENT - MSC

FACIAL DISTORTION WITH SMART PHONE PHOTOGRAPHY: THE IMPLICATIONS FOR PATIENT AND SURGEON PERSPECTIVES

Colton Boudreau, Alison Wong, **Anna Duncan**, Jenna Coles, Adrian Fish, Margaret Wheelock

PLASTIC SURGERY

BACKGROUND: Smartphones have become ubiquitous for self-taken photographs and before/after images by surgeons. This effects perception of body features, resulting in increased demand for aesthetic procedures. This study aims to explore smartphone camera incurred distortions in facial features using common smartphones compared to professional DSLR cameras.

METHODS: A model's face was imaged at average armlength (75 cm) with the camera at level (0°) with the nose or, to simulate selfie angles, 30° above or below. Five cameras were compared including Nikon DSLR with 22 mm lens and front/back cameras of iPhone 8 and Samsung Galaxy X7. Cephalometric measurements using predefined anatomical landmarks were obtained from photographs. Average ratio values of cephalometric measurements were calculated and compared using t-tests holding DSLR as standard.

RESULTS: Distortions were noted for all smartphone cameras tested. In general, vertically oriented anatomical features were more distorted than horizontal features. iPhone front/rear cameras and Samsung rear camera caused compression of central facial features and broadening of periphery. Conversely, the Samsung front camera tended to make central objects larger and peripheral objects smaller. Quantitative details of specific anatomical distortions are explored in depth in the complete results.

CONCLUSION: Smartphones displayed distortions when taking selfies at level and above/below face. This suggests that smartphone cameras have intrinsic distortions, likely resultant of differing optics and inherent software-based corrections. We propose there may be an over-correction of the typical "fish-eye" effect of smartphone lens leading to relative decreases in central facial features compared to peripheral. Awareness of these distortions are important to consider when patient requests are based around smartphone photographs.

VARIATION IN DURABILITY OF BIOPROSTHETIC AORTIC VALVES BY MANUFACTURER, AN ECHOCARDIOGRAPHY STUDY.

David Hodgson, Hashem Aliter, Osama Elkhateeb, Ryan Gainer, Gregory Hirsch

CARDIAC SURGERY

BACKGROUND: Aortic valve replacement (AVR) is one of the most common open-heart surgical procedures and with an aging population, its prevalence is on the rise. When it comes to valve selection, bioprosthetic valves are most often used in this position. We investigated the durability of aortic bioprostheses inserted in our centre using echocardiographic follow up.

METHODS: A retrospective analysis was conducted among all bioprosthetic valves with available echocardiographic follow up in Nova Scotia including 133 Trifecta, 156 Epic and 321 Magna Ease valves. Hemodynamic deterioration, defined as either the emergence of patient prosthesis mismatch or worsening of aortic valve pressure gradients were compared using transthoracic echocardiography including pressure gradients (mean and peak), and effective orifice area (EOA). Kaplan Meier analyses were used to summarize the time to failure.

RESULTS: Through univariate analysis, 216 (34%) of valves met failure criteria after a mean time of 24 months. Unadjusted survival curves showed a statistically significant difference between valve types (log-rank $p < 0.001$). Epic valves had the poorest durability, as compared to both Trifecta and Magna-Ease. From January 2007 to December 2016, 2551 valves were implanted for which we have adequate echo follow up on 610. 76% of patients had to be excluded for missing echo data.

CONCLUSION: This is the first study conducted on the QEII HSC experience of these three valves. The information gained from this study will supplement the available midterm data available from other centres. It will also shed a light on the proportion of patients at the QEII HSC with incomplete echo follow up.

MEDICAL STUDENT

THE NEED FOR TYMPANOSTOMY TUBES IN CHILDREN WITH RECURRENT ACUTE OTITIS MEDIA WITHOUT MIDDLE EAR EFFUSION

Alexander Clark and Paul Hong

ENT

BACKGROUND: Recurrent acute otitis media (AOM) may warrant tympanostomy tube placement. However, patients presenting without middle ear effusion (MEE) do not yet meet clinical practice guideline indications for surgical intervention. The objective of this study was to determine the rate at which patients ultimately received tympanostomy tube placement following initial evaluation that did not demonstrate MEE.

METHODS: In this retrospective case series, children presenting with recurrent AOM and no MEE were identified from October 2017 to October 2019. As per clinical practice guidelines, no surgery was offered initially. Patients were offered a semi-urgent return appointment should another suspected AOM episode occur after initial consultation. If MEE was observed, the option of tympanostomy tube insertion was provided. Patients were followed for one-year following enrolment.

RESULTS: One-hundred and nineteen patients were included. The mean age was 3.9 years (range 0.8-12.8). Sixty-eight (57%) patients did not require additional follow-up and thus did not require tympanostomy tubes. Fifty-one (43%) were seen for re-evaluation as they developed AOM related symptoms. Of these, 14 patients received tympanostomy tubes. Therefore, 88% of patients did not require tympanostomy tubes. There was no difference in the need for tympanostomy tubes between patients initially presenting in the autumn and winter months compared to the spring and summer months (15.9% vs 7.1%, $p=0.14$).

CONCLUSION: This study demonstrates the practical effect of adhering to the clinical practice guidelines for recurrent AOM and suggests that many children do not require tympanostomy tube placement within the first year after consultation if they did not initially present with MEE.

RESIDENT- ENT PGY 1

GLENOID BONE LOSS CAN BE PREDICTED USING GLENOID HEIGHT: A 3-DIMENSIONAL COMPUTED TOMOGRAPHY ANALYSIS IN A CANADIAN POPULATION

Johnny Rayes, Jian Xu, Sara Sparavalo, Jie Ma, Ivan Wong

ORTHOPAEDICS

BACKGROUND: Anterior shoulder instability is a common problem in the young active population with an incidence of 23.1 per 100,000 person-years in Canada. One of the most important factors in surgical decision-making for this pathology is the amount of glenoid bone loss. Currently, there is no consensus on the best technique for assessing glenoid width and bone loss. The purpose of this study is to investigate the relationship between glenoid width and other morphologic parameters using 3D-CT images of native shoulders to create a tool for measuring glenoid bone loss.

METHODS: 102 glenoid images were obtained for patients who underwent contralateral shoulder arthroscopy for anterior shoulder instability between 2012 and 2020. Subjects were excluded if they had a history of ipsilateral shoulder instability, shoulder fractures, or bone tumors. The following glenoid parameters were measured: width (W), height (H), anteroposterior (AP) depth, superior-inferior (SI) depth and version. Data was analyzed based on gender and age. Simple logistic regression, Kruskal-Wallis Rank tests and Fisher Exact tests were performed.

RESULTS: There were 71 male and 25 females with a mean age of 39.74 ± 17.88 years. Glenoid width was correlated with the height ($R^2=0.78$; $p=0.002$) and a regression model equation was obtained: $W=3.4+0.68 \cdot H$. There was also strong correlation with gender ($P<0.0001$), age ($P=0.0384$), and BMI ($P<0.0001$). Male gender was associated with higher measurement values for all parameters and older age was significantly correlated with larger glenoid width ($P=0.0015$ and $P=0.0104$, respectively).

CONCLUSION: Glenoid width and bone loss can be estimated using glenoid height. This is particularly important for surgical decision-making when facing glenoid defects in patients with shoulder instability.

CLILNICAL FELLOW

A QUALITATIVE STUDY OF FAMILIES' EXPERIENCES WITH MEDICAL ASSISTANCE IN DYING (MAiD) IN NOVA SCOTIA

Erika Leck, Caitlin Jackson-Tarlton, Ellen Crumley, Gord Gubitz

NEUROSURGERY

BACKGROUND: MAiD became legal in Canada in 2015, with Bill C-14 (2016) delineating eligibility criteria and access to MAiD. Previous research has shown that families are often intimately involved in the decision-making process, with conflicting perspectives seen regarding how they cope with the medically assisted death.

Our study sought to learn about the experiences of family members going through this process, and to determine what additional supports might be beneficial to the bereaved so as to improve MAiD delivery and aftercare.

METHODS: We conducted hour-long semi-structured interviews with 20 family members of individuals who had MAiD. Given Covid-19 constraints, interviews took place by telephone or virtually via MS Teams. Interview transcripts were analyzed using an established iterative coding process and thematic analysis.

RESULTS: Prominent themes emphasized the importance of respecting the individual's autonomy and decision-making, allowing them to regain a sense of control, when so much had been taken away by virtue of their illness.

The death itself was often described as peaceful. Interviewees were overwhelmingly filled with relief and gratitude for being able to respect the individual's wishes.

Interviewees invariably spoke of the importance of support for themselves, and identified a desire to build a network of individuals who have gone through similar experiences, allowing them to share their stories, grieve together, and support the next generation.

CONCLUSION: These results will help to improve MAiD delivery and aftercare in Nova Scotia, by informing, developing and enabling access to resources for individuals who accompany a family member on their end-of-life journey.

RESIDENT – NEUROSURGERY PGY 4 - CIP

INVESTIGATING THE ROLE OF B CELLS IN MELANOMA

Mark Hanes, S Nersesian, JE Boudreau, JS Marshall, CA Giacomantonio

GENERAL SURGERY

BACKGROUND: Melanoma-associated immune cells, stromal cells, and other supportive cell types populate the complex ecosystem in melanomas. Up to a third of the tumour-associated immune cells are B cells, a key cell in host defence against pathogens and many diseases. However, the role of B cells in melanoma remains unclear. We set out to uncover B cell functions in melanoma using murine models of melanoma and B cell-deficiency, and patient samples.

METHODS: Studies to evaluate B16-F10 tumourigenicity were performed using $\mu\text{Mt}^{-/-}$ B cell-deficient mice. Immunological characterisation of tissues was conducted via high-dimensional flow cytometry and multiplex immunofluorescence. A clinically relevant, novel oncogene-inducible B cell-deficient melanoma model was developed through a complex breeding program involving $\mu\text{Mt}^{-/-}$ mice and *Braf/Pten* mice. B cell cellular networks in FFPE-patient melanomas were investigated using immunofluorescence.

RESULTS: Flow cytometry identified B1 and B2 cells within B16-F10 melanomas with the former also abundant in the draining node. Using our $\mu\text{Mt}^{-/-}$ B cell-deficiency model, we showed that B16-F10 melanoma growth was slowed relative to B cell-sufficient mice. Moreover, macrophages displayed increased MHCII-expression in the draining node of B16-F10-bearing B cell-deficient mice. Tumour development studies and immunological characterisation of our novel B cell-deficient oncogene-inducible melanoma model are ongoing. To explore the potential diagnostic and prognostic potential of B cells, spatial mapping of B cell networks using samples of patient melanomas are also ongoing.

CONCLUSION: Our preliminary data suggest that B cells may support melanoma progression. Further understanding of B cell biology in melanomas is required to determine how these cells can be leveraged for therapeutic benefit.

GRAD STUDENT - PHD

THE PRO-INFLAMMATORY CHEMOKINE IL-8 IS EXTRACTED BY ULTRAFILTRATION IN CHILDREN UNDERGOING CARDIAC SURGERY WITH CARDIOPULMONARY BYPASS.

Joel Bierer, Roger L Stanzel, Mark Henderson, Ian Haidl, Suvro Sett, Pantelis Andreou, Jean S. Marshall, David Horné

CARDIAC SURGERY

BACKGROUND: Cardiac surgery with cardiopulmonary bypass (CPB) is associated with a systemic inflammatory syndrome. IL-8 is a key chemokine that activates and recruits neutrophils to the site of inflammation. Serum IL-8 concentrations are known to be increased during cardiac surgery with CPB as well as myocardial ischemia, acute respiratory distress syndrome and sepsis. Intra-operative ultrafiltration is hypothesized to extract pro-inflammatory cytokines during cardiac surgery and CPB to reduce systemic inflammation and enhance post-operative recovery.

METHODS: Twenty pediatric patients undergoing cardiac surgery with CPB and ultrafiltration were enrolled in an observational cohort study. Arterial blood samples were collected at baseline (after sternotomy but before CPB initiation) and at the end of CPB. An ultrafiltration effluent sample was taken at the end of CPB. IL-8 concentrations were measured by Luminex. Results are presented as medians (interquartile range), analyzed with Mann-Whitney test.

RESULTS: Serum IL-8 showed a significant increase from baseline of 12.6 (4.1-27.21) pg/ml to 41.9 (16.4-101.1) pg/ml at the end of CPB; $p=0.001$. Ultrafiltration effluent showed IL-8 concentration of 27.8 (8.5-39.9) pg/ml at the end of CPB.

CONCLUSION: IL-8 chemokine concentrations are significantly increased in pediatric patients undergoing cardiac surgery with CPB, consistent with previous studies. At the end of CPB, IL-8 concentrations in the ultrafiltration effluent were 66% that of the serum. This indicates significant extraction by ultrafiltration. Ongoing investigations will assess if serum IL-8 levels are correlated with post-operative clinical signals of inflammation, such as circulating neutrophil counts and vasoactive-inotrope-scores.

RESIDENT - CARDIAC SURGERY PGY 3 –CIP

DOES INTRAOPERATIVE BLOOD SALVAGE IMPACT LIVER TRANSPLANT SURVIVAL WHEN USED ON PATIENTS WITH VIABLE HEPATOCELLULAR CARCINOMA?

Ahmed Nasser, Victoria Smith, Niamh Campbell, Michael Rivers-Bowerman, Ashley Stueck, Andreu Costa, Boris Gala-Lopez

GENERAL SURGERY- TRANSPLANTATION

BACKGROUND: Use of intra-operative blood salvage (IBS) in liver transplant for hepatocellular carcinoma (HCC) is considered safe. However, there is little information of the possible impact of the actual tumor burden on recurrence and survival. The purpose of this study is to evaluate if the presence of viable HCC during transplantation modifies tumor recurrence and patient survival.

METHODS: Retrospective cohort study of liver transplants for HCC at Dalhousie University from 2005-2017. Locoregional therapy (LRT), IBS volumes and explant pathology information were collected. Variables were analyzed to find association with the primary outcomes, HCC recurrence and patient mortality via parametric and non-parametric tests. Kaplan-Meier and Log-rank tests were used to compare survivals.

RESULTS: Sixty-seven subjects were included, and IBS was used in 43% with a median volume of 711mL. Radiographic total tumor volume (TTV) correlated well with the actual tumor viable volume (TVV) (Pearson's $r=0.82$, $p<0.001$), but was overestimated ($p<0.001$). Seventy-one percent of patients were transplanted with viable tumors with a mean TVV of $5.3 \pm 9.7 \text{ cm}^3$. Vascular invasion was present in 70% and satellitosis, in 28% of explanted livers. However, none of these variables had a significant impact of patient recurrence ($p=0.30$) or patient survival ($p=0.72$, $p=0.78$ and $p=0.80$, Log-rank).

CONCLUSION: The use of IBS during liver transplantation in patients with viable HCC has no impact on cancer recurrence or patient survival. These findings were not altered when performing a sub analysis of tumors with lymphovascular invasion or the presence of satellitosis. This technique is safe to use regardless of the actual tumor burden during the transplant procedure.

MEDICAL STUDENT

PSYCHOSOCIAL DISTRESS IN PARENTS WITH CHILDREN AWAITING SURGERY DURING THE COVID-19 PANDEMIC

Abdullah Aldaihani, D Forner, PK. Leslie, M Bezuhly, CW. Noe , D Horne, S Walling , J Robitaille , D MacLellan, Ron El-Hawary, R Romao, R LaRoche , R Urquhart, Paul Hong

OTOLARYNGOLOGY

BACKGROUND: Waiting for surgery can be difficult for both parents and children. Due to resource restrictions related to the COVID-19 pandemic, many pediatric patients are facing longer wait times than usual, potentially resulting in additional distress for caregivers. We aimed to assess the experiences and psychosocial distress of parents in this setting.

METHODS: Cross-sectional qualitative study of parents of children who faced treatment delays during the initial wave of the COVID-19 pandemic for elective, non-urgent procedures across a variety of specialties. Semi-structured interviews were held and themes were identified through thematic analysis.

RESULTS: Four themes were identified: coping, distress levels, quality and nature of communication with the surgical team, and the experience of COVID-19 related hospital restrictions. While participants' daily routines had changed drastically, they discussed coping well during the pandemic. Despite this, participants reported varying levels of distress due to the delay in surgery, such as the fear of developmental delay or disease progression for their child. They also indicated their physical and mental health had been impacted by emotional distress related to both COVID-19 and delays in treatment. Most parents were informed about the delay via telephone with the surgeon's office, though some were not informed at all and were simply still waiting for a date for surgery. Most participants experienced the COVID-19-related hospital restrictions as distressing. This related predominantly to limiting in-hospital caregivers to one support person only.

CONCLUSION: Participants were found to have substantial levels of psychosocial distress. Targeted social and emotional support may be helpful in reducing parental distress as the pandemic timeframe continues.

RESIDENT - ENT PGY 2

POST COVID-19 PATIENT THROUGHPUT SIMULATION FOR SURGICAL RESOURCE ALLOCATION

Natalie Ash, Dr. VanBerkel, Dr. Kamal, Geoff Porter, Michael Dunbar

BME/SURGERY

In response to the COVID-19 pandemic, most elective surgical procedures in Nova Scotia were cancelled resulting in increased patient waitlist volumes. Understanding the impacts of resource allocation is crucial to developing an effective strategy to reduce the waitlist.

A discrete event simulation model was developed to analyze the overall potential throughput of elective surgical patients. Descriptive analytics of two years (2018-2020) of surgery data from the Central Zone of Nova Scotia Health informed the development and inputs of the model. The model facilitated scenario analysis of the impacts of resource allocation. Scenarios for post COVID-19 included increasing bed capacity and operating room (OR) hours. Further, COVID-19 scenarios included a second wave, increased OR sanitation time, and increased demand.

The base model, which reflected the current system parameters, indicated the waitlist grew continuously with ophthalmology, orthopedics, and general surgery comprising 70%. The outpatient waitlist decreased to a steady state, whereas the inpatient waitlist continuously increased. The scenario analysis quantified that increasing the OR hours impacted the waitlist more than increasing the bed capacity. The largest waitlist decrease, 40% as compared to the base model, occurred when ORs were scheduled on the weekends.

The overall throughput is limited by the patient's surgical specialty as well as the number of ORs available. The number of available OR hours and specified approach for surgical specialties had the largest impact on the waitlist. These two approaches to resource allocation would positively impact the waitlist created by the COVID-19 pandemic. The largest threat to the waitlist is increased demand from surgical cancellations due to COVID-19.

GRAD STUDENT – MSC BME

PATIENTS WHO LIVE > 1 HOUR FROM THE TERTIARY CENTER EXPERIENCE DECREASED SURVIVAL FOLLOWING ASCENDING AORTIC OPERATIONS

Claudia Cote, Dominique De Waard, Gavin Tansley, Ansar Hassan, Mohammad Hajizadeh, Christine Herman

CARDIAC SURGERY

BACKGROUND: The purpose of this study was to determine the effect of travel time from the tertiary care center on outcomes in emergent and elective ascending aortic repair in our province.

METHODS: A retrospective analysis of all elective and emergent ascending thoracic aortic operations from 2005 and 2015 at our institution was performed. Baseline characteristics and in-hospital outcomes were recorded. Patient's place of residence corresponding to a defined geographical area was used to calculate estimated driving distance to the tertiary care center and to derive socioeconomic status (SES) variables. Long-term survival was obtained from vital statistics. The population was divided into 2 groups based on estimated driving time to the tertiary care center <1 hour or ≥1 hour. Adjusting for clinical characteristics and SES, Cox proportional hazard modeling was performed to determine the independent effect of estimated travel time on long-term survival.

RESULTS: A total of 476 patients underwent ascending thoracic aortic surgery. Mean age was 59.1 years (±13.3 years) and 107 (22.5%) were female. Estimated driving time was ≥1 hour for 248 (52.1%) of patients. Median follow-up was 4 years [IQR 1.9-6.5 years] and 73 (15.3%) patients died during the 2,074 patient-years of follow-up. Following adjustment for socioeconomic deprivation, and clinical risk factors, patients who lived >1 hour from the tertiary center had increased long-term mortality (HR 2.07, 95% Confidence Interval 1.07-4.02, p=0.03).

CONCLUSION: Compared to patients who live in close proximity to the tertiary center, patients at increased travel time from the tertiary care center experience decreased long-term survival following ascending aortic operations.

RESIDENT – CARDIAC SURGERY -CIP

ACOUSTIC INTERPRETATION OF LIDOCAINE SPRAY FOR DETERMINATION OF OPTIMAL COMFORT IN NASOPHARYNGOSCOPY

Matthew Biskup and Mark Taylor

OTOLARYNGOLOGY

BACKGROUND: Flexible nasopharyngoscopy has classically been performed using an arbitrary decision on which side of the nose to pass the scope. Clinical experience shows that one side of the nose may be more uncomfortable to pass a scope mostly due to internal nasal anatomy. Until now, there has been no clearly documented way of determining the optimal side. We proposed that the sound profile of lidocaine spray can be used for this purpose.

METHODS: Participants in the study underwent a scope down each nare following lidocaine spray for anesthesia. A sound recording of the spray down each nare, along with an expert prediction based on the sound was compared to the comfort rating of patients and the ease of scope rating by the operator.

RESULTS: An expert can accurately predict which side of the nose will be easier and more comfortable to pass a scope greater than 70% of the time based on the sound of lidocaine spray with a p-value less than 0.05. To rule out bias, this was confirmed objectively, with different sound profiles predicting the more comfortable side greater than 80% of the time, again with a statistically significant result.

CONCLUSION: Lidocaine spray can be used as a low cost, effective way of determining what nare is easier to pass with instrumentation. This can be expanded to procedures such as NG tube placements or nasal intubations, where visual guidance is not an option. This can further be expanded to an app that could automate this process, due to the objective difference in sound profiles.

RESIDENT – ENT PGY 3

ALTERED miRNA EXPRESSION FOLLOWING SPINAL CORD INJURY (SCI)

Mustafa Nadi, S.Pillai, Sean Christie

NEUROSUGERY

BACKGROUND: SCI is a deleterious event resulting in significant, longstanding neurological morbidity. Currently, there is no cure for SCI. Further understanding of secondary SCI mechanisms may facilitate finding therapeutic interventions that promote neuroprotection and retention of neurological function. This study aims to understand the genetic response to SCI via analyzing microRNA (miRNA) expression patterns and their gene targets.

METHODS: Transgenic mice (Thy1-YFP strain), following a T10 laminectomy, were divided into 3 experimental groups (Sham, Control, Treatment). A moderate-grade, computer-controlled contusion injury was delivered to the control (saline) and treatment (minocycline) groups. RNA from a 5 mm SC segment around the injury epicenter was extracted after 24hr and 7d survival. Next Generation Sequencing identified target miRNA. Quantitative reverse transcription polymerase chain reaction (RT-qPCR) and digital droplet polymerase chain reaction (ddPCR) confirmed results.

RESULTS: Differential miRNA expression was found between experimental conditions. At the 24hr time-point, 59 miRNAs were significantly downregulated, while 22 were significantly upregulated between Treatment and Control groups. Following 7d survival, 7 miRNAs were upregulated and 7 downregulated. RT-qPCR were run on a subset of miRNA at the two time points and displayed significant changes in the expression of miR21a-5p and miR15b-5p in the 24hr group.

CONCLUSION: miRNA sequencing and RT-qPCR demonstrated miR21a-5p and miR15b-5p expression were most significant 24 hr after SCI. They contribute to inflammatory, apoptotic, and oxidative pathways, especially NF-kB and PI3K-Akt signalling pathways. The observed difference in miRNA expression likely reflects the protective effect of minocycline. Studying miRNA expression after SCI may facilitate a better understanding of secondary SCI mechanisms, potentially leading to effective treatments.

GRAD STUDENT - PHD

PROLONGED KIDNEY PROCUREMENT TIME IS ASSOCIATED WITH WORST OUTCOMES AFTER KIDNEY TRANSPLANTATION

F. Reyna-Sepulveda, D Badrudin, Boris Gala-Lopez

GENERAL SURGERY - TRANSPLANTATION

BACKGROUND: During organ procurement and after ice removal, kidneys located in the retroperitoneum are at risk of rewarming by the time taken to retrieve other abdominal and thoracic organs. The purpose of this study is to evaluate the impact that a prolonged kidney procurement (PKP) time during organ procurement has on kidney transplantation outcomes.

METHODS: A total of 145 patients were reviewed. We defined PKP as >65 minutes for organ extraction versus standard procurement (SP) time <65 minutes.

RESULTS: No statistically significant differences were seen in outcomes when comparing kidney only (KOP) versus multi organ procurements. For the case of the PKP group, they had a much higher rate (6.6% vs 0%, $p<0.01$) of early graft failure compared to the SP group. PKP also had more commonly the presence of donor specific antibodies (DSA) (10% vs 5.2%, $p=0.33$), and an inferior graft survival of 90% vs 97.4% ($p=0.03$).

CONCLUSION: Procurement time, when longer than 65 minutes, is an important and potentially modifiable factor that influences not only early but long-term graft survival.

CLINICAL FELLOW

CRISPR-BASED TAGGING OF ENDOGENOUS NEURONAL PROTEINS.

Dylan Quinn and Jim Fawcett

PHARMACOLOGY

BACKGROUND: CRISPR-based molecular approaches have drastically improved the ease and cost of genomic engineering. A recently published CRISPR toolbox for neurons, called ORANGE, describes a method for tagging endogenous neuronal proteins. This approach allows the detection of protein location and protein expression levels in living neurons.

METHODS: The ORANGE approach utilizes a single plasmid with three features: 1) the cDNA for Cas9, an RNA-guided protease which cleaves (opens) the genome at user-defined target sites, 2) the guide RNA to program Cas9 to sites which match the target, 3) the cDNA for a molecular tag (GFP), flanked by synthesized DNA sequences which match the genomics target sequence. Upon expression of the plasmid in neurons, Cas9 opens the genome and excises the tag from the plasmid, allowing for integration at the genomic target site.

RESULTS: We show that ORANGE efficiently labels synaptic proteins and the neuronal cytoskeleton in cultured hippocampal neurons. We use this system to image a novel protein called SH2D5, which is a mammalian-specific, uncharacterized scaffold-like protein that is highly expressed in the brain. We reveal that SH2D5 localizes to the presynaptic compartment in hippocampal neurons. Future studies will define the function of SH2D5 at mammalian synapses.

CONCLUSION: Live imaging of protein spatial information will be paramount in understanding how the genetic programs of cells operate in health and disease. The CRISPR-based methods describe here provides a genetic toolbox to acquire these data in living cells.

POST DOC

WHAT IF I WASN'T THERE? FACULTY PERCEPTIONS OF A COMPREHENSIVE SIMULATED ASSESSMENT FOR SURGICAL RESIDENTS

Kevin Morash, G Richardson, W Oxner, L Gauthier, SA. Scott, R. Andrew Glennie

ORTHOPAEDICS

BACKGROUND: The emergence of competency-based medical education has renewed focus on our system's failure to address deficient performance amongst surgical trainees. To this end, we have introduced an annual Comprehensive Surgical Objective Structured Clinical Examination (CS-OSCE) that provides a broad assessment of resident readiness for independent orthopaedic practice. The purpose of this study was to describe faculty evaluators' experiences of the CS-OSCE, focusing on the following areas: their common observations, the perceived role of this exam in surgical education and its subsequent impact on clinical teaching.

METHODS: We conducted semi-structured interviews with seven faculty members who have recurrently evaluated the annual CS-OSCE. Interviews were transcribed, coded and analyzed to identify common themes, which were then organized into broad categories corresponding to our three research areas.

RESULTS: Common observations: In evaluating a CS-OSCE, faculty gained awareness of the impact of their own presence across clinical environments. They noted substantial variability in performance, particularly in response to unanticipated challenges.

Role in education: The CS-OSCE was perceived as a high-fidelity assessment. It was considered to have powerful educational and catalytic effects, while promoting safety.

Influence on teaching: Faculty expressed renewed commitment to instruction of history-taking and physical examination. They were compelled to allow greater autonomy and to tailor instruction towards observed deficiencies.

CONCLUSION: Evaluating a CS-OSCE provides faculty members with insight into resident knowledge, behaviors and the impact of subtle cueing. This exam also re-frames learning while supporting patient safety. Lastly, the CS-OSCE maintains appropriate emphasis on non-technical skills and promotes autonomy. Given its potential educational and catalytic effects, we encourage its incorporation into other surgical programs.

FUNCTIONAL AND ONCOLOGICAL OUTCOMES OF OCTOGENARIANS UNDERGOING TRANSORAL LASER MICROSURGERY FOR LARYNGEAL CANCER

Lee Changseok, David Forner, Christopher W. Noel, Victoria Taylor, Colin MacKay, Matthew H. Rigby, Martin Corsten, Jonathan R. Trites, S. Mark Taylor

OTOLARYNGOLOGY

BACKGROUND: Elderly patients are a growing demographic of patients with head and neck cancer, possessing advanced comorbidity status and unique quality-of-life considerations. There is limited data on the efficacy and safety of transoral laser microsurgery (TLM) for elderly patients with laryngeal cancer. The purpose of this study was to evaluate the oncological and functional outcomes of TLM for glottic cancers in patients older than 80 years of age.

METHODS: This case series used a prospectively collected glottic cancer database to examine consecutive elderly patients (≥ 80 years old) undergoing TLM at the QEII Health Sciences Centre in Halifax, Nova Scotia. Kaplan-Meier analysis was used to evaluate disease-free survival (DFS), disease-specific survival (DSS), and overall survival (OS) as the primary endpoints of oncologic control. Secondary functional outcomes included voice function measured by the Voice Handicap Index-10, length of hospital stay, and time to readmission.

RESULTS: From 2005 to 2017, 17 octogenarian patients underwent TLM for glottic cancer. Median follow-up was 4.19 years (IQR 0.71-6.95). Kaplan-Meier estimates of 5-year DFS, DSS, and OS were 78.4%, 92.9%, and 81.9%, respectively. The median length of hospital stay was 1 day (range 0-8 days). There was only one 30-day readmission. No patients in this study developed significant surgical or postoperative complications requiring unplanned readmissions. Patient perceived voice function improved to normal after treatment in 62.5% of patients.

CONCLUSION: The results of this study suggest that TLM is a safe and effective treatment modality for glottic cancer in patients over the age of 80, providing good oncological control and satisfactory functional outcomes.

MEDICAL STUDENT

ACROMETASTASIS TO THE HAND: A SYSTEMATIC REVIEW AND META-ANALYSIS OF 641 CASES

Caitlin Davis, Todd Dow, Jason Williams

PLASTIC SURGERY

BACKGROUND: To examine all known cases of acrometastasis to the hand available in the known literature. This uncommon presentation of metastatic disease is often mistaken for a benign process and is typically associated with a dismal prognosis. The objective of this review is to analysis metastasis characteristics and prognosis based on the primary tumour and provide treatment recommendations.

METHODS: An online systematic review of MEDLINE, EMBASE, Pubmed and The Cochrane Library from inception to January 7, 2021 was completed. Studies outlining the care of a patient with acrometastases of the hand were included. Data extracted included patient age, sex, site of primary tumour, location of acrometastasis, treatment management and survival rates.

RESULTS: Four hundred eighty-five articles published between 1889 and present were found to meet the inclusion criteria. These articles described 641 cases of metastases to the hand. The mean age among patients was 59.3 +/- 13.3 years and men were twice as likely to develop a metastasis (401:214). The most common primary cancer source was the lung (248, 38.7%), followed by the kidney (76, 11.6%) and the breast and colon (49 each, 7.6%). Majority of patients had an single metastases of the hand (500, 78%). The distal phalanx of the thumb was the most frequently cited tumour location (75, 11.7%). The most common form of treatment was amputation of the affected area. Mean survival following diagnosis of acrometastasis was 8.4 +/- 13.5 months.

CONCLUSION: Acrometastasis remains an uncommon presentation of metastatic disease with poor prognosis. Treatment currently focuses on pain management and optimizing functional outcomes.

MEDICAL STUDENT

THE EFFECT OF FOLLOW-UP FREQUENCY IN THE FIRST 90 DAYS ON THE OUTCOME OF PRIMARY TOTAL KNEE AND TOTAL HIP ARTHROPLASTIES

James Larkin, Glen Richardson, Lynn Lethbridge, Michael Dunbar

ORTHOPAEDICS

BACKGROUND: The success of total knee (TKA) and total hip arthroplasty (THA) have resulted in some clinicians questioning the utility of routine follow-up. We used administrative data to determine the variability of follow-up visits and its effect on patient outcomes.

METHODS: Data on primary TKAs and THAs from 2001-2018 were accessed. Ninety-day follow up patterns of 27 TKA surgeons and 24 THA surgeons were assessed against General Practitioner (GP) visits and Emergency Department (ED) visits in the same 90-day period. ED visits and re-admissions in the 91-365 day period were also tested. Statistics for cases without co-morbidities (ie “typical”) were evaluated as well as an expanded sample which included those with co-morbidities. Multivariate logistic regression was used to control for confounders.

RESULTS: There were 4085 and 3180 typical cases and 10,826 and 7637 for the expanded sample for TKA and THA, respectively. Mean follow-up visits post-TKA were statistically significantly greater ($p < 0.0001$) for TKA 1.95 (range 1.28 - 2.85) compared to THA 1.84 (range 1.21 - 2.87). There was a negative correlation between surgeon follow-up and GP visits (TKA $p = 0.007$, THA $p = 0.0004$) while no association was shown with ED visits or re-admissions for typical cases or the expanded sample. Co-morbidities were negatively associated with surgeon follow-up for both TKA ($p = 0.025$) and THA ($p = 0.037$).

CONCLUSION: Variability exists in the follow-up patterns across surgeons and are apparent between TKA and THA. Increased GP visits but not ED visits or readmissions suggests that GPs may be able to safely undertake routine follow-up care. This study highlights potential implications of standardized routine follow-up care.

CLINICAL FELLOW

A QUANTITATIVE DEGENERATIVE LUMBAR SPONDYLOLISTHESIS INSTABILITY CLASSIFICATION (DSIC) SYSTEM TO REDUCE VARIATION IN SURGICAL TREATMENT

Mark A. MacLean, Chris Bailey, Charles Fisher, Raja Rampersaud, Andrew Glennie

NEURSURGERY / ORTHOPAEDICS

BACKGROUND: The Degenerative lumbar Spondylolisthesis Instability Classification (DSIC) system categorizes three different types of spondylolisthesis (stable, potentially unstable, and unstable) based on surgeon impression. It does not contain objective criteria. **Objective-1:** Develop a quantitative DSIC system from predetermined radiographic and clinical variables. **Objective-2:** Compare qualitative (surgeon-assigned) DSIC Types to quantitative (objective) DSIC Types. **Objective-3:** Determine proportion of patients receiving more invasive surgery than warranted based on the quantitative DSIC system.

METHODS: Patients from 8 tertiary care centers were enrolled prospectively from 2015–2020. Radiographic and clinical variables were collected and included/excluded from the quantitative DSIC system based on prior systematic review. Scores were converted to DSIC Types: 0-2 points (“Stable”; Type 1), 3 points (“Potentially Unstable”; Type 2), 4-5 points (“Unstable”; Type 3). Surgical procedures performed were compared to those directed by the objective DSIC system.

RESULTS: Quantitative DSIC scores were calculated (309 patients). Five variables were included in the score: presence of facet effusion, disc height (>6.5mm), translation (>4mm), kyphotic or neutral disc angle on flexion radiographs, and presence of low back pain (LBP) (>5/10 intensity). Quantitatively, there were 176 (57%) stable, 106 (34%) potentially unstable, and 27 (9%) unstable patients. Qualitatively, there were 92 (30%) stable, 164 (53%) potentially unstable, and 53 (17%) unstable patients. Surgeons qualitatively assigned higher degrees of instability than the DSIC scoring system in 42% of cases. More invasive surgery was performed in 57% of cases.

Conclusion: Surgeons are more likely to categorize greater degrees of spinal instability than what is objectively scored. This had a significant impact on resource utilization within this patient cohort.

RESIDENT – NEUROSURGERY PGY 3

BARRIERS AND FACILITATORS OF COST AWARENESS IN AORTIC VALVE REPLACEMENT (AVR) SURGERY: A QUALITATIVE STUDY ON PROVIDER PERSPECTIVES

Sophia Roy, Ryan Gainer, Greg Hirsch

CARDIAC SURGERY

BACKGROUND: The awareness of cost drivers surrounding aortic valve replacements (AVR) has been shown to be low among cardiac health care providers. We sought input from cardiac health care providers about their level of intraoperative cost awareness, cost decision making and potential motivators that would encourage cost decision-making in the OR in an effort to reduce overall costs in AVR surgery.

METHODS: Separate focus groups were held for cardiac surgeons (n=5), cardiac anesthesiologists (n=5), cardiac perfusionists (n=8), OR nurses (n=5) and cardiac residents (n=4). Semi-structured interviews were used to elicit provider perspectives on the barriers and facilitators to implementing intraoperative cost decision making. Transcribed audio data was iteratively analyzed through the use of thematic analysis to develop a core set of common and comprehensive themes.

RESULTS: Five main themes were identified: cost awareness, intraoperative decision making, influence surrounding intraoperative cost decision making, provider-based motivation for implementing intraoperative cost decision making, and cost drivers for an AVR. Providers expressed a willingness to engage in cost decision making if patient outcome would not be negatively influenced. Providers had low cost awareness and felt uncertain in which intraoperative decisions would actually lower overall cost. Non-surgeon groups felt they had minimal influence on intraoperative decisions. Providers suggested motivators such as a punishment-reward system, receiving cost feedback and listing the price of drivers in the OR.

CONCLUSIONS: Health care providers demonstrated low cost awareness regarding cost drivers of AVRs. They expressed interest in engaging in cost decision making that was informed by cost containment, yet expressed uncertainty in which decisions would lead to lower AVR cost. Measures such as listing the price of cost drivers in the OR and providing cost feedback could potentially encourage engagement in cost decision making for AVRs.

GRAD STUDENT

LONG-TERM LARYNGOTRACHEAL COMPLICATIONS FOLLOWING CARDIAC OPERATIONS IN ADULTS

Claudia Cote, Jonathan Melong, Philippe Tremblay, Graeme Mullins, **Matthew Cooper**, Michael Vician, Tim Brown, Christine Herman

CARDIAC SURGERY

BACKGROUND: Prolonged intubation occurs in 4-8% of cardiac surgery patients and has been shown to lead to long term laryngotracheal complications. However, the incidence of these complications has yet to be described in adult cardiac surgery patients. The purpose of this study was to determine the incidence of and risk factors for laryngotracheal complications in this patient population.

METHODS: Patients who were considered high risk for laryngotracheal complications that underwent cardiac surgery at our centre between 2006-2016 were included in this retrospective chart review. High risk was defined as patients requiring pre-operative intubation, ventilation time ≥ 7 days, or reintubation. Laryngotracheal complications included posterior glottic stenosis (PGS), subglottic stenosis (SGS), keyhole deformity, isolated vocal cord immobility (VCI), and tracheal stenosis (TS) after surgery or ICU stay. Multivariable logistic regression analyses were used to assess risk factors for laryngotracheal complications.

RESULTS: We identified 1,099 high risk patients out of 11,417 that underwent cardiac surgery between 2006 and 2016. The incidence of long-term laryngotracheal complications in these patients was 2.2%, and the most common complications were PGS (0.6%), SGS (0.6%), and keyhole deformity (0.5%). Risk factors for laryngotracheal complications were found by logistical regression to be younger age (age ≥ 70 OR 0.31, 95% Confidence Interval (CI) 0.12-0.83), readmission to ICU for ventilation (OR 3.11, 95% CI 1.17-8.25), and receiving a tracheostomy (OR 7.83, 95% CI 2.22-27.6).

CONCLUSION: The incidence of laryngotracheal complications in high risk cardiac surgery patients was found to be low at 2.2%. Risk factors for these complications were shown to be younger age, readmission to ICU, and undergoing tracheostomy.

RESIDENT – CARDIAC SURGERY –CIP

PSYCHOSOCIAL DISTRESS IN ADULT PATIENTS AWAITING CANCER SURGERY DURING THE COVID-19 PANDEMIC

David Forner, S Murnaghan, G Porter, RJ Mason, P Hong, M Taylor, J Bentley, G Hirsch, CW Noel, M Rigby, M Corsten, J Trites, V Taylor, C Kendell, M Jorgensen, Robin Urquhart

OTOLARYNGOLOGY

BACKGROUND: Cancer causes substantial emotional and psychosocial distress, which may be exacerbated by delays in treatment. The COVID-19 pandemic has resulted in increased wait times for many patients with cancer. In this study, the psychosocial distress associated with waiting for cancer surgery during the pandemic was investigated.

METHODS: This cross-sectional, convergent mixed-methods study included patients with lower priority disease during the first wave of COVID-19 at an academic, tertiary care hospital in eastern Canada. Participants underwent semi-structured interviews and completed two questionnaires: Hospital Anxiety and Depression Scale (HADS) and Perceived Stress Scale (PSS). Qualitative analysis was completed through a thematic analysis approach, with integration achieved through triangulation.

RESULTS: Fourteen participants were recruited, with cancer sites including thyroid, kidney, breast, prostate, and gynecological. Increased anxiety symptoms were found in 36% of patients and depressive symptoms in 14%. Similarly, 64% of patients experienced moderate or high stress. Six key themes were identified, including uncertainty, life changes, coping strategies, communication, experience, and health services. Participants discussed substantial distress associated with lifestyle changes and uncertain treatment timelines. Participants identified quality communication with their healthcare team and individualized coping strategies as being partially protective against such symptoms.

CONCLUSION: Delays in surgery for patients with cancer during the COVID-19 pandemic has resulted in extensive psychosocial distress. Patients may be able to partially mitigate these symptoms through various coping mechanisms and improved communication with their healthcare teams.

RESIDENT – ENT PGY 3

TOWARDS EVIDENCE BASED DESIGN AT THE HALIFAX INFIRMARY

Laure Nolte, Michael Dunbar, Aaron Newman

ORTHOPAEDICS/ARCHITECTURE

BACKGROUND: In its current state, the Halifax Infirmary has serious design issues that may be negatively impacting the health and well-being of patients and staff. Evidence based design (EBD) theory provides a framework to assess building decisions and physical space layout to improve the design health of clinical spaces using best available evidence to provide a mitigation strategy. There is significant opportunity to review and incorporate EBD practices to ensure the QEII complex is performing optimally as the foremost healthcare centre in Atlantic Canada.

METHODS: Two site visits to the Halifax Infirmary building of the QEII complex were carried out in October and November of 2020 by an individual trained in EBD, focusing on surgical patients' experiences with registration, processing for surgery and subsequently travelling to operative theatres. Photographic mapping was performed along the patient's journey to allow for identification of EBD deficiencies, focusing on lighting, wayfinding, aesthetics and flow. A literature review focused on identified EBD deficiencies was completed to assess the impact these environmental factors have on patient health outcomes and to propose strategies for improvement.

RESULTS: A lack of natural light and views to nature, as well as a dependence on florescent lighting were identified. These factors can interfere with proper circadian rhythm function, negatively influence recovery outcomes from surgery, and increasing length of stay. In addition to optimizing occupational well-being, lighting variability in hospital environments can reduce medical errors. Wayfinding signage was also found to be deficient, which can increase patient stress as well as leading to reduced staff productivity. EBD mitigation strategies around lighting and wayfinding signage are available to improve identified deficiencies that would be cost-effective.

CONCLUSION: The healthcare system in Nova Scotia is theoretically modeled on EBD. When looking at the multitude of identified design issues present in the patient facing peri-operative spaces of the Halifax Infirmary, a question emerges as to why EBD practices have not been considered standard protocol for designing healthcare environments. Adopting a methodology towards EBD can yield cost-effective improvements in the design health of existing structures and provide direction for healthy design for both patients and staff in future buildings.

GRAD STUDENT – MA ARCHITECTURE

Thursday April 8th, 2021

6:00PM – 8:30PM

Chair: Dr. Katerina Neumann

Malik Ali

Olga Bednarek

Ryan Gainer

Sultan Almualllem

Carlos E. Restrepo

Usman Khan

Rafaela Andrade-Viera

Bradley Evans

Connor McGuire

Anna-Claire Lamport

Shawn Brophy

Nicholas Blake

Frederick Michael

Ryan Greene

PREOPERATIVE SURGICAL VISITATION PATTERNS AND ASSOCIATED INCREASES IN POST-OPERATIVE EMERGENCY DEPARTMENT VISITS, HOSPITAL READMISSIONS, AND POST OPERATIVE COMPLICATIONS IN HIP AND KNEE ARTHROPLASTY PATIENTS.

Malik Ali, L. Lethbridge, G. Richardson, M. Dunbar

ORTHOPAEDICS

BACKGROUND: Preoperative surgical visits are essential in reviewing patient indications, surgical candidacy, and realistic expectations of surgery. Variation in patterns of pre-surgical care may exist between surgeons and subsequently effect patient outcomes. The study purpose was to assess the variation of pre-surgical care prior to total hip and knee arthroplasty (THA/TKA) and its effect on post-operative outcomes.

METHODS: The study cohort was constructed from NS hospital discharge abstract data using Canadian Classification of Health Intervention codes to select primary THA/TKA procedures from 2005-2017. Associations between surgical and GP visits categorized by surgeon, patient-level outcomes, emergency department visits(ED), re-admissions, and surgical complications were analyzed.

RESULTS: The mean number of surgeon visits were 4.19 while GP visits were 25.1 prior to TKA. Increased GP visits showed associations with increased surgeon preoperative visits, an increase of 1.02 for every extra surgeon visit (p-value 0.01). Presurgical surgeon visits were positively associated with post-operative ED presentations (OR1.1) and medical complications (OR1.2). Surgeon visits over 180 days before surgery were more likely associated with ED visits and complications.

The mean number of surgeon visits were 3.27 while GP visits were 23.1 prior to THA. Increased GP visits were not associated with increased surgeon presurgical visits. Presurgical surgeon visits were not associated with ED presentations or hospital readmissions. However, there was a positive association with post-operative medical complications (OR1.35).

CONCLUSION: There is an association between presurgical visitation rates and early emergency department presentations and post-operative complications in TKA and post-operative complications in THA. These effects were more prominent in patients waiting more than 180 days for the index procedure.

RESIDENT – ORTHO PGY 1

TRAUMA TEAM PERCEPTIONS REGARDING IN-SITU SIMULATION

Olga Bednarek, Sam Jessula, Sam Minor

GENERAL SURGERY

BACKGROUND: In-situ simulation provides an excellent tool for training, education, and quality improvement in trauma care. While the benefits have been well described, there is a potential for harm or delay to patient care while running an unscheduled simulation with working staff members. The aim of this study is to assess trauma team member's perceptions regarding the value of in-situ simulation relative to its perceived impact on patient care.

METHODS: A longitudinal survey study was conducted between February 2019 and July 2020 and included all members of the multidisciplinary trauma team at a level 1 trauma centre in Nova Scotia, Canada. Following each monthly in-situ simulation, participants were given a 10-question survey with answers on a 5-point Likert scale.

RESULTS: 103 surveys were completed. Survey respondents included physicians, trainees, and allied health staff. Simulations were infrequently felt to compromise patient care, and minimal patient harm was described. In-situ simulations were felt to improve many important aspects of trauma care, including communication and identification of latent safety issues. When the required time to complete an in-situ simulation increased to practice COVID protocols, the perceived major benefits of in-situ relative to its potential harm did not change.

CONCLUSION: A trauma in-situ simulation program is not perceived to cause delays or compromise patient care. Trauma in situ training is perceived to be a good learning opportunity that identifies safety issues and improves patient care.

RESIDENT- GENERAL SURGERY PGY 3

EXAMINING THE ASSOCIATION BETWEEN DOMAINS OF FRAILTY AND 6-MONTH CHANGES IN HEALTH-RELATED QUALITY OF LIFE, LIVING STATUS, AND TREATMENT DECISIONAL REGRET AMONG OLDER PATIENTS REFERRED FOR CARDIAC SURGERY

Ryan Gainer, G Ilie, Robin Urquhart, Pantelis Andreou, Greg Hirsch

CARDIAC SURGERY

BACKGROUND: Both age and frailty function as key preoperative risk factors for cardiac surgery. Age (chronological measurement) alone is usually a poor marker for predicting older patients' health status, most likely due to failure to reflect functional status in the measurement. Frailty status, which takes function into account, may be a better measure for older patients' health status, although multiple operational definitions of this construct exist. A small number of studies have demonstrated that frailty is a risk factor for various adverse outcomes after cardiac surgery, in older patients.

OBJECTIVES: The overall goal of this research was to determine the impact of varying degrees of frailty on the functional recovery of patients who undergo cardiac surgery. Specific objectives were as follows: (1) Determine the association between domains of frailty and change in HRQoL at baseline and 6 months post-surgery, (2) dependent living status at 6 months post-surgery (3) and treatment decisional regret at 6 months post-surgery.

METHODS: A prospective cohort pre-post design was used to evaluate the exposure (frailty) and resulting outcomes (change in HRQoL; dependent living status; treatment decisional regret). Frailty was assessed preoperatively using the FACT, a frailty instrument that categorizes frailty in domains of mobility, social circumstances, daily tasks, and cognition. The primary outcome was HRQoL, measured preoperatively and at 6 months using EQ-5D-3L/EQ-VAS. Secondary outcomes were, dependent living status and treatment decisional regret, measured using the Functional Independence questionnaire, both assessed at 6 months post-surgery.

RESULTS: Worse ADL function was positively associated with higher levels of impairment in mobility and usual function HRQoL from baseline to 6 months. As well, worse ADL function was negatively associated with greater HRQoL improvement in men as measured by index scores and across all procedure types as measured by EQ-VAS. Worse mobility function was negatively associated with higher levels of improvement in HRQoL in isolated AVR patients. Lastly, those with worse ADL function had higher odds of experiencing a dependent living status 6 months after surgery (aOR = 2.06 (1.42, 3.00)), and worse ADL (aOR = 1.89 (1.35, 2.65) and cognitive (aOR = 1.77 (1.26, 2.47) function had higher odds of regretting their decision to have surgery.

DISCUSSION: The current study showed domain-specific frailty, particularly poor pre-operative ADL function, is negatively associated with an individual's capacity to return to optimal HRQoL post-operatively, independent living status and positively associated with experience of decisional regret. The evidence-based data has the potential to better inform patients who are at risk for loss of HRQoL and independence with cardiac surgery, allowing them to make decisions in line with values and preferences. Educating patients on the risks of frailty is an important aspect of patient-centered care and individualized prevention decision-making strategies based on patient priorities

ERADICATION OF HELICOBACTER PYLORI IN PATIENTS UNDERWENT SLEEVE GASTRECTOMY: SHOULD IT BE PERFORMED AND BY WHO?

Sultan Almuallem and Dr James Ellsmere

GENERAL SURGERY

BACKGROUND: It is common to find H. Pylori infection on pathology reports in asymptomatic patients undergoing sleeve gastrectomy. It is not clear in the literature whether treating this infection is necessary and whether it should be done in the bariatric clinic or in the primary care setting.

METHODS: We retrospectively reviewed our bariatric and drug information system from January 1, 2009 to December 31, 2018 to assess the effectiveness of prescribing patients post sleeve gastrectomy with eradication therapy.

RESULTS: During the study period, 478 cases of sleeve gastrectomy were performed. Of those, 25 patients were found to have histologic diagnosis of H. Pylori infection (5.2%). The median age was 50; 16 were female (64%). At initial follow up, 20 (80%) of patients with H. pylori infection were prescribed PPI triple therapy for 10-14 days. The most interesting finding was that 11 (44%) of those patients didn't comply. Only 32% of patients completed the course. Of those, only 25% had confirmation testing performed. The other 5 (20%) of patients with H. pylori infection, were advised to follow up with their primary care practitioner regarding the result.

CONCLUSION: Based on the variable rationales for treatment and need for continuity of care, we believe management decision for H. Pylori infection in bariatric patients will need upfront planning, strict follow up and clear communication between all health care teams involved.

RESIDENT – GENERAL SURGERY PGY 3

EFFICACY OF AN IMAGE-BASED PROGRAMING PLAN IN PREDICTING THE FINAL STIMULATION CONFIGURATION FOR SUBTHALAMIC NUCLEUS DEEP BRAIN STIMULATION.

Carlos E. Restrepo, Christine Potvin, Peggy MacNeil, Weise, Lutz

NEUROSURGERY

BACKGROUND: Subthalamic nucleus stimulation (STN-DBS) is a well established therapy for Parkinson's disease (PD). Initial programing of the DBS electrodes may take up to 2 hours to complete a detail monopolar mapping in order to determine the contact(s) with the best and worse therapeutic response and threshold for side effects. New imaging technology allows reconstruction and visualization of the DBS electrode and adjacent structures in a tridimensional space which in turns permit to infer which contact(s) could be best for the stimulation.

METHODS: In this study we analyzed the efficacy of an image-based programing plan (IBP) to predict the clinical response to stimulation in 23 patients that underwent STN-DBS.

RESULTS: Twenty-two electrodes (176 contacts) were evaluated. The spatial position and distance of each electrode contact was analyzed in a normalized space with respect to the STN, motor portion of the STN (mSTN) and the corticospinal tract (CST) to predict the best (positive) and worst (negative) options for stimulation. The resulting selection was then compared with the final stimulation plan obtained by the monopolar review which is the gold standard. A chi-square analysis demonstrated a significant association between the IBP and the final therapeutic configuration ($p < 0.05$). The IBP showed to have sensitivity of 92.3%, specificity of 81.4%, positive predictive value of 81.82%, negative predictive value of 92.1% and accuracy of 86.5%.

CONCLUSION: An Imaged-based programing plan could be used as a guide to predict the best electrode configuration in order to reduce the programing time, this may translate in better use of hospital resources, improve the patient comfort and may avoid further returns for programing.

CLINICAL FELLOW

COMPARISON OF FRENOTOMY TECHNIQUES FOR THE TREATMENT OF ANKYLOGLOSSIA IN CHILDREN: A SYSTEMATIC REVIEW

Usman Khan, Jake MacPherson, Michael Bezuhly and Paul Hong

OTOLARYNGOLOGY

BACKGROUND: The treatment of Ankyloglossia or tongue-tie remains a controversial topic. The objective of this study was to compare the effectiveness of conventional (CF), laser (LF), and Z-plasty (ZF) frenotomies for the treatment of ankyloglossia in the pediatric population.

METHODS: Relevant articles were independently assessed by 2 reviewers according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. The data was reported using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Outcomes assessed were breastfeeding difficulty, speech, anesthesia requirements and adverse events.

RESULTS: Thirty-five articles assessing CF (27 articles), LF (4 articles), ZF (3 articles) and/or rhomboid-plasty frenotomy (1 article) were included. A high level of outcome heterogeneity prevented pooling of all data. There were reports of improvement with breastfeeding outcomes as assessed on validated assessment tools for 88% (7/8) of CF articles (588 patients) and two LF articles (78 patients). A patient-weighted mean improvement in visual analogue scale (VAS) scores of -3.2 and -2.7 was observed following CF and LF, respectively for non-RCT studies. CF was exclusively performed without any general anesthesia in infants, whereas ZF requires general anesthesia in all cases. Only minor adverse events were reported for all frenotomy techniques.

CONCLUSION: This is the first systematic review comparing different frenotomy techniques. The current literature does not demonstrate a clear advantage for one frenotomy technique when managing children with ankyloglossia. CF was more commonly performed without anesthetic when compared to LF and ZF. We conclude that all frenotomy techniques are safe and effective for treating symptomatic ankyloglossia.

RESIDENT- ENT PGY 1

NCK PROTEINS PLAY A ROLE IN MUSCLE REGENERATION AND FUNCTION.

Rafaela Andrade-Vieira, Alessandro Santuz, Crystal Milligan, Victor Rafuse, Turkey Akay, Zhang Ying, Jim Fawcett.

PHARMACOLOGY

BACKGROUND: Skeletal muscle regeneration is essential to maintain muscle integrity and function. The loss of proteins involved in this cascade compromises muscle function. Loss of muscle mass is also correlated with a number of muscle related disorders, aging and life expectancy. Adaptor proteins like NCK1 and 2 play an important role by allowing for the development of intracellular signaling cascades. These proteins are also linked to cellular remodeling through their role in actin dynamics.

METHODS: Using molecular biology methods, we show NCK is expressed in muscle tissue. We also analyzed muscle strength and muscle loss using electrophysiology and electron microscopy. In addition, we used advanced kinematics to determine if muscle changes affect walking patterns.

RESULTS: We find that NCK1 and NCK2 are essential for myogenesis and muscle function. Loss of either NCK1 or NCK2 leads to muscle sarcopenia, decreased muscle strength and drives satellite cells expression. Conditional deletion of both NCK isoforms leads to muscle degeneration and survival.

CONCLUSION: We find that NCK1 and NCK2 are necessary for myogenesis and muscle strength. This loss in strength is due to defects in muscle development and regeneration. Although NCK proteins have been shown to bind to muscle proteins, our discovery showed for the first time a novel role of NCK in muscle proliferation and aging. Because muscle tissue is directly related to quality of life and life expectancy it is important to understand the role of NCK in muscle tissue and address the key tasks of these proteins driving myogenesis.

GRAD STUDENT – POST DOC

COLONOSCOPY SKILLS IMPROVEMENT (CSI) TRAINING IMPROVES PATIENT COMFORT DURING COLONOSCOPY

Bradley Evans, I. Hossain, M. Ennis, E. O'Brien, L. Bacque, M. Miné-Goldring, M. Ge, J. Brodie, J. Harnett, M. Borgaonkar, J. Ellsmere, D. Pace
General Surgery

GENERAL SURGERY

BACKGROUND: We aimed to assess the effect of CSI training on patient comfort and sedation related complications during colonoscopy.

METHODS: This retrospective cohort study was performed on 19 endoscopists practicing in a tertiary care center in St. John's, Newfoundland who completed CSI training between October 2014 and May 2016. Data from 50 procedures immediately prior to, immediately after, and eight months following CSI training were included for each endoscopist. The primary outcome variable was intraprocedural comfort and secondary outcomes included intraprocedural hypotension and hypoxia. Data were extracted from an electronic medical record and analyzed using SPSS version 20.0. Univariate analysis and stepwise multivariable logistic regression were performed to determine if there was an association between patient comfort and CSI training. Predictors of these outcomes including patient age, gender, sedation use and dosing, procedure completion, quality of bowel preparation, endoscopist experience and specialty were included in the analysis.

RESULTS: 2533 colonoscopies were included in the study. The mean dose of sedatives was reduced immediately following CSI training and at 8 months for both Fentanyl (75.4mcg v. 67.8mcg v. 65.9mcg, $p<0.001$) and Midazolam (2.57mg v. 2.27mg v. 2.19mg, $p<0.001$). The percentage of patients deemed to have a comfortable exam improved following endoscopist participation in CSI training and remained improved at 8 months (55.1% v. 70.2% v. 69.8%, $p<0.001$). No significant change in rates of intraprocedural hypoxia or hypotension were noted following CSI training.

CONCLUSION: CSI training is associated with improved patient comfort and reduced sedation requirements during colonoscopy.

CLINICAL FELLOW

PIEZOSURGERY VERSUS CONVENTIONAL CUTTING TECHNIQUES IN CRANIOFACIAL SURGERY: A SYSTEMATIC REVIEW & META-ANALYSIS

Connor McGuire, Colton Boudreau, Neetin Prabhu, Paul Hong, Michael Bezuhly

PLASTIC SURGERY / OTOLARYNGOLOGY

BACKGROUND: Despite its increasing use in craniofacial surgery, the evidence for piezosurgery over conventional bone cutting techniques has not been critically appraised. The purpose of this systematic review and meta-analysis is to identify and assess the evidence that exists for the use of piezosurgery in craniofacial surgery.

METHODS: A systematic review was undertaken using a computerized search. Publication descriptors, methodological details, and outcomes were extracted. Articles were assessed using the MINORS and Cochrane instruments. Random effects meta-analysis was completed.

RESULTS: Thirty-nine studies were included. Most studies were published within the last five years (51.3 percent) and were randomized controlled trials (56.4 percent). The mean age of patients was 27 (range 0.2 to 57), while the mean sample size was 44 (range 12 to 180). Meta-analysis revealed that compared to conventional instruments, piezosurgery had a lower post-operative incidence of sensory disturbance principally in mandibular procedures (odds ratio: 0.29; 95% confidence interval [CI]: 0.11, 0.77; $p = 0.01$) and pain at postoperative day three (mean difference [MD]: -0.86; 95% CI: -1.20, -0.53; $p < 0.01$). There was no statistically significant difference in operating room time (MD: 8.60; 95% CI: -1.27, 18.47; $p = 0.80$) or osteotomy time (MD: 0.35; 95% CI: -2.99, 3.68; $p = 0.84$). Most studies were clinically homogenous (92 percent) and of high quality based on the MINORS instrument (84 percent). Few studies had domains at high risk of bias based on the Cochrane instrument (28.6 percent).

CONCLUSION: Piezosurgery has benefits when compared to conventional instruments. Future studies should investigate its cost-effectiveness and benefits in terms of blood loss, edema/ecchymosis, and patient satisfaction.

RESIDENT – PLASTIC SURGERY PGY 2

ACCURACY OF THE INTRAOPERATIVE BONE MARGIN SAMPLING PROTOCOL FOR HEAD AND NECK CANCERS INVOLVING BONE AT THE QEII HEALTH SCIENCES CENTRE

Anna– Claire Lamport, Colin A. MacKay, Martin J. Bullock, S. Mark Taylor, Jonathan R. Trites, Martin Corsten, Matthew H. Rigby

OTOLARYNGOLOGY

BACKGROUND: Head and neck cancers involving bone pose a challenge for intraoperative bone margin assessment due to time-consuming decalcification requirements. Methods for rapid analysis of bone have been proposed, but no standardized protocol has been implemented at the QEII Health Sciences Centre. The goals of this study were to assess oncologic outcomes of patients that underwent resection of head and neck tumors invading bone based on their bone margin status on final pathology and to quantify the use of intraoperative bone margin assessment.

METHODS: This study was a retrospective chart review encompassing 2009-2019. Patients eligible for the study must have undergone primary surgical resection of a stage T4a head and neck cancer invading bone at the QEII Health Sciences Centre.

RESULTS: Of the 69 patients included in the study, 8 patients underwent intraoperative bone margin sampling. Five patients had positive bone margins on final pathology, none of whom underwent intraoperative sampling. The 5-year overall survival of those with negative final margins was 43.0%, whereas no patients with positive final margins were living at 5 years. The 5-year recurrence-free survival was 48.4% for those with final negative bone margins, whereas no patients with final positive bone margins survived recurrence-free for 5 years.

CONCLUSION: Positive final bone margins were a predictor of higher morbidity and mortality at 5 years compared to those with negative margins, however a small sample size made statistical analysis difficult. This data will serve as a baseline for standardized intraoperative bone margin sampling protocols that will be implemented at the QEII HSC.

MEDICAL STUDENT

RECURRENCE OF PRIMARY SPONTANEOUS PNEUMOTHORAX FOLLOWING BULLECTOMY WITH PLEURODESIS OR PLEURECTOMY: A RETROSPECTIVE ANALYSIS

Shawn Brophy, Kelly Brennan, Daniel French

GENERAL SURGERY - THORACICS

BACKGROUND: Primary spontaneous pneumothorax (PSP) is managed initially with observation and chest tube placement, followed by surgery in select cases. With little currently published evidence, the role of surgical pleurodesis or pleurectomy to reduce PSP recurrence is unclear. This study compares the recurrence rates of PSP following bullectomy alone versus bullectomy with pleurodesis or pleurectomy.

METHODS: A retrospective review was performed at a quaternary hospital for all patients undergoing surgery for PSP between June 2006 and December 2018. Patient demographics, disease severity, operative technique, and time between initial surgery and recurrence were recorded. Standard statistical techniques were used for univariable and multivariable analyses.

RESULTS: Of 222 total included patients, 28 required a second surgery. The median time from first to second surgery was 363 days and 35.7% of recurrences did not present until after two years. On multivariable analysis, the odds ratios of recurrence for bullectomy with mechanical pleurodesis or pleurectomy were respectively 0.82 and 0.15 ($p=0.218$), compared to bullectomy alone. Combined bullectomy, pleurectomy, and pleurodesis had the lowest recurrence rate (0/18, 0%).

CONCLUSION: Bullectomy with pleurectomy and pleurodesis demonstrated a 0% recurrence rate for the treatment of PSP in this study. Statistical significance was not achieved in univariable or multivariable analyses comparing recurrence rates for the surgical approaches. A multi-center randomized controlled trial with longer follow-up than previously performed is needed to confirm these preliminary findings and optimize surgical management of PSP.

RESIDENT- GENERAL SURGERY PGY 4

A PROVINCE WIDE ASSESSMENT OF THE APPROPRIATENESS OF LUMBAR SPINE MRI

Nicholas Blake, R Greene, D LeBlanc, D Duquette, S Amero, H Daniels, M Schmidt, S Christie.

NEUROSURGERY

BACKGROUND: Canada wide, overuse of MRI scans for the lumbar spine is prevalent, with up to 2/3 of scans possibly being inappropriate. Choosing wisely Canada guidelines do not recommend general practitioner-initiated imaging for low back pain unless red flags are present. The appropriateness of imaging for the lumbar spine has not yet been examined in Nova Scotia.

METHODS: An evidenced-based algorithm was developed which determined the appropriateness of imaging. All lumbar spine MRI requisitions in 2018 were analyzed by four reviewers, determining if the scan was appropriately ordered or not. Cohen's Kappa was used to assess inter-rater reliability of the reviewers. The frequency of those referred to a spine surgeon with an inappropriate scan was then abstracted. Demographic variables included age and sex. Other variables included specialty of the ordering physician, month the scan was ordered, and the location the scan was performed. All analysis was performed via chi-square testing and significance was obtained at $p < 0.05$.

RESULTS: A total of 3185 requisitions were abstracted, with 1905 (59.8%) of them being considered appropriately ordered. Significant differences were observed amongst different specialties for physicians in ordering patterns ($p < 0.001$). Regional differences in the appropriateness of ordering MRIs were observed ($p < 0.001$), even though all locations in Nova Scotia ordered more appropriate scans than inappropriate.

CONCLUSION: Approximately 60% of all lumbar spine MRIs ordered are considered appropriate. There is significant unnecessary use in the healthcare system due to inappropriately orders scans. More work needs to be implemented to improve education regarding the proper use of ordering MRIs.

MEDICAL STUDENT

IS INTERPOSITION ALLOGRAFT BRIDGING RECONSTRUCTION APPROPRIATE IN PATIENTS OLDER THAN 60 YEARS OLD? A RETROSPECTIVE MID-TERM ANALYSIS

Sara Sparavalo, MASC; Jie Ma, MES; **Fredrick Michael**, MD; Ivan Wong, MD

ORTHOPAEDICS

BACKGROUND: The prevalence of massive, irreparable cuff tears in patients over 65 is reported to be as high as 22%. Recent operative treatment guidelines suggested that age is a risk factor for rotator cuff repair failure, thus older patients are often treated using arthroplasty, which is a costly and invasive procedure. Therefore, it is important to consider age in patients who received bridging reconstruction - a new treatment option for patients with irreparable rotator cuff tears. Our study's purpose was to determine whether bridging reconstruction results in positive patient-reported outcomes, regardless of patient age.

METHODS: We performed a retrospective review on patients who underwent bridging reconstruction by the senior author from 2015-2018 with a two-year minimum follow-up. Exclusion criteria included patients with instability, irreparable subscapularis tears, and glenoid fractures. Patients were stratified into two age groups. Our primary outcome was measured using the Western Ontario Rotator Cuff (WORC) Index. Secondary outcomes included post-operative complications and graft tears.

RESULTS: 81 patients met our inclusion/exclusion criteria (<60(n=39) and >60(n=42) years of age) with similar distributions of gender and surgery type (primary or revision). Both groups demonstrated a significant improvement in WORC scores at most-recent follow-up ($p < 0.001$). Over 85% of patients met the minimal clinically important difference for WORC with no significant difference between groups ($p = 0.620$). There were no differences in graft tear incidence as detected using MRI between the groups ($p > 0.05$).

CONCLUSION: Our results demonstrate that elderly patients with irreparable, massive cuff tears can have improved pain and function following treatment with bridging reconstruction, suggesting this may be a viable and less invasive treatment option.

CLINICAL FELLOW

DEVELOPMENT OF A FRAILTY INDEX FROM THE CANADIAN SPINE OUTCOMES RESEARCH NETWORK (CSORN) TO PREDICT LONG TERM SUCCESS OF SURGERY FOR PATIENTS WITH DEGENERATIVE PATHOLOGIES OF THE SPINE

Ryan Greene, S Chrisite, S. Kehler, L Julien and Ken Rockwood

NEUROSURGERY

BACKGROUND: Frailty represents a reduced ability to respond to stressors. It has been observed that surgical candidates are more prevalently frail than the general population. Recently, frailty indexes (FI) have been developed with the goal to predict disease course. The main objective of this study is to determine if a FI can be developed based off of routinely collected tests, specifically for patients who undergo spine surgery.

METHODS: A frailty index was developed using the Canadian Spine Outcomes Research Network (CSORN), based on 56 variables that contributed to the index. The FI was then used to determine how frailty impacted patient disability following surgery. A binary logistic regression was performed for the dependent variable of achieving a minimal clinically important difference (MCID) for the Oswestry disability index (ODI), while controlling for age, sex, BMI and smoking status. Significance was taken at $p < 0.05$.

RESULTS: A total of 4824 people were included. At 3 months and 1 year following surgery, patients with a higher FI (>0.2) were more likely to achieve MCID than those who had a low FI (<0.2), with $p < 0.001$ and $p = 0.004$ respectively. At 2 years, BMI and age were the only factors which contributed to determining if MCID would be reached ($p < 0.001$ and $p < 0.001$).

CONCLUSION: The FI developed through the CSORN database is robust and can help predict the chances of a patient achieving MCID for their disability following surgery. The FI is also easy to implement as it is based on commonly collected data for patients. Patients with a higher FI are much more likely to achieve MCID.

GRAD STUDENT – PHD

Monday April 12, 2021

6:00 PM – 8:30 PM

Chair: Dr. Christine Herman

SK Dalal

Alex Harper

Heather McFadgen

Ibrahim Shahin

Garret McDougall

Victoria Smith

Andres Campos Mendez

Kathryn Young-Shand

Chad Purcell

Rakesh Gudimella

Marzie Saghayi

Pooja Patel

Margaret Sun

FUNCTIONAL AND PSYCHOLOGICAL OUTCOMES OF PATIENTS WITH LUMBAR DISC HERNIATION TREATED WITH PRIMARY DISCECTOMY VERSUS REVISION DISCECTOMY SURGERY.

SK Dalal and Sean Christie

NEUROSURGERY

BACKGROUND: The lumbar discectomy is the gold standard treatment for lumbar disc herniation and commonest procedure in spine surgery. Despite excellent outcomes, literature suggests that recurrent lumbar disc herniation is the primary cause of surgical morbidity in these patients(5-18%).Best management option for RLDH is revision discectomy. The purpose of this study is to compare the functional and psychological outcomes in patients with primary vs revision discectomy.

METHODS: Patients enrolled in the Canadian National Registry(CSORN) having undergone lumbar discectomy and MRI evidence of recurrent lumbar disc herniation underwent revision discectomy included

RESULTS: Our study included 935 patients, 888 were primary discectomy and 47 were revisions with incidence of 5.027%. We observed no significant differences between gender, smoking status in both groups. The revision group being both older and having higher BMI, difference is not statistically significant.

We analysed all these patients over short(3 month) and long-term(1 year) follow-up for functional and psychological outcomes with the ODI,SF-12,Health scale,PHQ9.

We didn't find any significant difference in functional and psychological outcomes between both groups on short term follow up. However, EQ5D index is significantly higher at 1 year follow up in primary discectomy group. Patients with primary discectomy having significantly better ODI at 1 year follow up as compare to revision group. Importantly, there is significant improvement in the mental component of short form (MCS) at long term follow up in Primary discectomy group.

CONCLUSION: Functional and psychological outcomes are better in patients underwent primary discectomy in comparison to revision at 1 year follow up in Canada. Needs studies with longer follow up.

CLINICAL FELLOW

BUTTON FIXATION DOES NOT AFFECT THE LEARNING CURVE AND SHORT-TERM RADIOGRAPHIC OUTCOMES FOR ARTHROSCOPIC ANATOMIC GLENOID RECONSTRUCTION WITH DISTAL TIBIA ALLOGRAFT

Alex Harper₁, Sara Sparavalo, Jie Ma, Ivan Wong

ORTHOPAEDICS

BACKGROUND: Arthroscopic anatomic glenoid reconstruction (AAGR) using tibial allograft is a technique used to treat recurrent anterior shoulder instability with bone loss. The original technique used screw fixation and more recently, a technique has been described using button fixation. The purpose of this study was to compare the learning curve and graft positioning of screw fixation with button fixation for AAGR.

METHODS: We performed a retrospective review on patients underwent AAGR with button fixation from 2018-2020. These patients were compared to the first set of patients who received AAGR with screw fixation in 2015-2018. All patients received AAGR from the senior author and had a short-term post-operative CT scan. Exclusion criteria included patients with rotator cuff pathology, multidirectional instability and glenoid fractures. Surgical times and post-operative graft positioning were compared between the two groups.

RESULTS: There were 43 patients (Screw:27; Button: 16) who met the inclusion/exclusion criteria. The average operative time for the button and screw fixation groups were 1.35 ± 0.22 and 1.55 ± 0.32 hours, respectively. The button group showed a significant reduction in operative time compared to the screw group ($p=0.029$). The graft positioning for both groups was on the lower third (button:n=14; screw:n=24) and middle third (button:n=2; screw:n=3) with no significant difference between the groups ($p=0.891$). Button fixation results in good horizontal positioning with respect to medial-lateral step formation, with slightly better positioning being achieved using screw fixation ($p=0.033$).

CONCLUSION: AAGR has a short learning curve regardless of fixation type, with button fixation resulting in a shorter operative time. The surgical times for both fixation types are comparable to existing arthroscopic stabilization techniques.

MEDICAL STUDENT

EVALUATING DISPARITIES IN ACCESS TO DIAGNOSTIC AND THERAPEUTIC INTERVENTIONS FOR PULMONARY MALIGNANCY AMONG VISIBLE MINORITIES IN CANADA.

Heather McFadgen, Lynn Lethbridge, Michael Dunbar, Madelaine Plourde

GENERAL SURGERY - THORACICS

BACKGROUND: The risk of pulmonary malignancy in Canada is known to be negatively related to socioeconomic status, though the influence of ethnicity is less defined. With increasing awareness of discrepancies in access to medical care for visible minorities, more data is needed to quantify the nature of these discrepancies. The present study seeks to examine trends in lung cancer diagnosis and access to relevant diagnostic and therapeutic interventions among visible minorities in Canada.

METHODS: Data from the 2006 Canadian long-form census was linked to the CIHI DAD and NACRS databases over a 12-year period (2005-2016). Diagnostic codes for pulmonary malignancy, and procedure codes for lung and airway investigations and therapeutic lobectomy were used to determine rates of in-hospital diagnosis and procedures for visible minorities compared to non-visible minorities. Multivariate regression analysis was undertaken to control for confounders such as household income.

RESULTS: Before adjusting for confounders, rates of diagnostic and therapeutic lung procedures were found to be lower for visible minorities. This observation is apparent across provinces, with results statistically significant with 95% confidence. On multivariate analysis, visible minorities were less likely to receive an in-hospital diagnosis of pulmonary malignancy or undergo lobectomy. There was no significant difference for rates of lung and airway investigations.

CONCLUSION: Significant differences in rates of in-hospital diagnosis of pulmonary malignancy, as well as the relevant therapeutic interventions were noted between visible minorities and non-visible minorities across Canada. These findings identify areas where future research may be focused to identify targetable factors to guide public health initiatives to address these discrepancies.

NOS1AP REGULATES INTEGRIN DEPENDENT ACTIVATION OF RHO

Ibrahim Shahin, Josee Normand, and James Fawcett

PHARMACOLOGY

BACKGROUND: In a bioinformatic screening, we have shown that Nitric Oxide Synthase 1 Adaptor Protein (NOS1AP) binds to Integrin $\beta 3$ in a highly conserved and specific manner. We sought to investigate how integrin signalling occurs in the absence of NOS1AP in order to understand the function of the interaction between NOS1AP and Integrin $\beta 3$.

METHODS: We have generated a cell line of mouse embryonic fibroblasts (MEFs) that do not express NOS1AP. By plating MEFs on fibronectin we activate integrin signalling in order to investigate the process in the absence of NOS1AP. Using a Rho kinase inhibitor, we determined if the phenotype observed in NOS1AP^{-/-} cells was Rho dependent. Immunoprecipitation experiments were used to determine if NOS1AP co-precipitates with integrin $\beta 3$, in order to verify the bioinformatic findings. Since Rho dependent integrin signalling is important in osteoclast biology we aimed to investigate if NOS1AP is involved in osteoclast function.

RESULTS: We show that in the absence of NOS1AP, integrin signalling is unregulated in a Rho dependent manner. NOS1AP^{-/-} MEFs plated on fibronectin exhibit a significantly high amount of nuclear blebbing, indicative of increased pulling by the cytoskeleton in response to the integrin signalling. This phenotype was rescued by applying a Rho kinase inhibitor, indicating that this process is Rho dependent. Preliminary findings show that NOS1AP precipitates integrin $\beta 3$, indicating a structural relationship. Additionally, we show that NOS1AP is expressed in osteoclasts and localizes to the nucleus.

CONCLUSION: Taken together, our data proposes that NOS1AP is important in integrin $\beta 3$ signalling. The loss of NOS1AP dysregulates integrin signalling a Rho-dependent manner.

GRAD STUDENT

SOCIOECONOMIC STATUS DOES NOT AFFECT POST-OPERATIVE OUTCOMES IN AAA REPAIR PATIENTS IN NOVA SCOTIA

Garrett McDougall, Claudia L. Cote, Samuel Jessula, Min Lee, Matthew Smith, Patrick Casey, Christine Herman

CARDIAC SURGERY

BACKGROUND: Abdominal Aortic Aneurysm (AAA) repair is associated with significant postoperative morbidity and mortality. The association between socioeconomic status (SES) and outcomes after AAA repair is poorly described in publicly funded health systems. This study aimed to determine the effect of SES on postoperative outcomes in AAA repair patients in Nova Scotia.

METHODS: A retrospective analysis of all elective AAA repair patients between 2005 and 2015 was performed using administrative data sources. Postoperative 30-day outcomes and long-term survival were compared across socioeconomic quintiles, defined as the Pampalon Material Deprivation Index (MDI) and Social Deprivation Index (SDI). The relationship between baseline characteristics, MDI, SDI, and 30-day mortality were analyzed by univariable logistic regression. Multivariable logistic regression and survival analysis were used to calculate adjusted 30-day mortality and long-term survival, respectively.

RESULTS: 1829 patients underwent AAA repair from 2005-2015. 30-day outcomes including death ($p=0.91$), stroke ($p=0.75$), myocardial infarction ($p=0.06$), length of stay ($p=0.35$), and discharge to home ($p=0.85$) were similar across MDI quintiles. The same was true across SDI quintiles. After adjusting for variables that were statistically significant on univariable analysis (age, sex, history of stroke, and open approach), multivariable analysis revealed age >70 (OR 2.41, CI 1.51-3.84; $p<0.001$), history of stroke (OR 2.21, CI 1.27-3.94; $p=0.006$), and open repair (OR 4.93, 2.37-10.26; $p<0.001$), but not MDI ($p=NS$) or SDI ($p=NS$) to be associated with increased 30-day mortality. There was no effect of MDI or SDI quintile on long-term survival on univariable or multivariable analysis.

CONCLUSION: SES does not appear to affect short nor long-term mortality after AAA repair in Nova Scotia.

MEDICAL STUDENT

COMPARING PREDICTED-TO-OBSERVED 5-YEAR SURVIVAL AFTER LIVER TRANSPLANT FOR HEPATOCELLULAR CARINOMA: HOW DOES VIABLE TUMOR BURDEN INFLUENCE PREDICTIVE CAPABILITY OF THE METROTICKET MODEL?

Victoria Smith, M Rivers-Bowerman, A Costa, A. Stueck, N. Campbell, S Allen, B Gala-Lopez

GENERAL SURGERY – TRANSPLANTATION

BACKGROUND: The Metroticket Project produced prognostic calculators for patients undergoing liver transplant (LT) for hepatocellular carcinoma (HCC). Pathology-based (MT-P), and radiology-based (MT-R) calculators predict five-year survival. Our objective is to evaluate how viable tumor burden at explant, impacts the predictive capability of the Metroticket models.

METHODS: A retrospective cohort analysis of HCC LT patients in Halifax from 1996-2019 was conducted. Locoregional therapy (LRT) data, radiographic HCC parameters, and explant pathology findings including tumor viability were collected. Metroticket values were calculated with these data. Radiographic total tumor volume (TTV) and explant total viable tumor volume (TVV) were correlated. Survival of patient subgroups was assessed using Kaplan-Meier curves, and compared via Log-rank testing, with sub analysis using relevant pathology variables. Finally, predicted versus observed survival was compared by patient subgroups.

RESULTS: Eighty patients were included. TTV and TVV correlated strongly (Pearson's $r=0.98$, $p<0.001$), with imaging overestimating TVV by 35%. There was no significant difference in overall survival if patients underwent LRT ($p=0.46$), if tumors were viable ($p=0.48$), or had microvascular invasion ($p=0.76$). Tumor satellitosis did impact survival (62.5 months versus 106.3 months, p -value=0.03, HR=2.47). Observed, 5-year survival was significantly lower than predicted by MT-R (90% versus 64%, p -value<0.001), but not by MT-P ($p=0.47$). When considering only viable tumors, observed 5-year survival was worse than predicted by MT-P (62% versus 66%, $p<0.01$).

CONCLUSION: Tumor viability appears to impact the accuracy of the Metroticket model. The presence of satellitosis significantly impacts long-term outcomes, though other tumor characteristics do not in this series. Refinement of the Metroticket model including these variables may augment its efficacy.

RESIDENT – GENERAL SURGERY PGY 3

PRIMARY INTERPOSITION DERMAL ALLOGRAFT CUFF RECONSTRUCTION IS SUPERIOR TO REVISION AFTER FAILED CUFF REPAIR: A CLINICAL AND RADIOGRAPHIC ANALYSIS

Andres Campos Mendez, Nedal Al-Khatib, JP King, Sara Sparavalo, Jie Ma, MES; Ivan Wong

ORTHOPAEDICS

BACKGROUND: There is no consensus on the best treatment for large/massive rotator cuff tears. Previous studies have shown that allografts can be used for bridging reconstruction with positive patient outcomes, but this has not been studied in the primary or revision surgical setting. The purpose of this study is to compare the clinico-radiographic outcomes of patients who received primary or revision arthroscopic bridging reconstruction.

METHODS: This study is a retrospective review of patients who underwent arthroscopic bridging reconstruction between 2010-2018. The inclusion criteria were patients with completed Western Ontario Rotator Cuff (WORC) questionnaires, pre and post-operatively. Eighty-three patients were included. Available post-operative MRIs were also assessed by an independent MSK-trained radiologist for graft integrity and rotator cuff muscle atrophy and fatty degeneration.

RESULTS: Forty-six patients received primary surgeries while 37 patients were revisions. Forty-eight patients had a post-operative MRI available (Primary:25; Revision:23). The demographics were similar in both groups ($p>0.05$). Though, both groups showed a significant improvement in WORC scores post-operatively ($p<0.001$), primary reconstruction resulted in significantly higher WORC scores ($p=0.015$). The revision group showed a higher progression in muscle atrophy (74%) and a higher incidence of complete re-tears (8.0%) compared to the primary group (30%, 17.4%). Over 35% of patients in the primary group showed improvement in fatty infiltration of the infraspinatus and supraspinatus muscles.

CONCLUSION: Primary arthroscopic bridging reconstruction for large/massive rotator cuff tears had better improvements in WORC scores at the final follow-up, a smaller re-tear rate, better fatty infiltration and muscle atrophy compared to revision surgery. This suggests that primary bridging reconstruction provides better outcomes than a revision surgery.

CLINICAL FELLOW

MAPPING KNEE OSTEOARTHRITIS BIOMECHANICS USING AN UN-SUPERVISED LEARNING FRAMEWORK

Kathryn L. Young-Shand, Patrice C. Roy, Syed S. R. Abidi, Michael J. Dunbar, Janie L. Astephen Wilson

ORTHOPAEDICS/ BME

BACKGROUND: Characterizing osteoarthritis (OA) gait biomechanics progression pathways is relevant to non-invasive and total knee arthroplasty (TKA) intervention strategies. This study aimed to develop an unsupervised self-organized map (SOM) framework to map variability in longitudinal OA gait biomechanics, and characterize progression pathways within the SOM.

METHODS: Three-dimensional knee kinematics and kinetics were collected from observations of asymptomatic (n=236), moderate knee OA (n=341), severe knee OA (pre-TKA; n=145) and post-TKA (n=201) gait. Principal component analysis (PCA) was applied to frontal and sagittal knee angle and moment waveforms, resulting in a new uncorrelated PC score dataset describing 95% of gait waveform variability. PC scores, spatiotemporal gait, and demographic features were applied to the SOM, followed by hierarchical clustering. Clusters were validated by examining inter-cluster differences by chi-squared, k-way ANOVA and Kruskal Wallace test. OA clinical severity transitioned from mostly asymptomatic to mostly severe across the SOM's x-axis.

RESULTS: Age and BMI increased, and gait speed decreased across the SOM ($p < 0.001$). This coincided with worsening knee biomechanics, captured by reduced flexion angle magnitudes ($p < 0.001$), flexion angle range ($p < 0.001$), and knee adduction moment mid-stance unloading ($p < 0.001$). Three clusters within the SOM aided in interpretation, characterized as 1) High Function Gait; 2) Low Function Gait; and 3) Moderate Function Gait. Knee biomechanics during OA gait can be characterized using SOMs to provide a multidimensional interpretation of gait biomechanics severity pathways.

CONCLUSION: Longitudinal changes in individual SOM location can provide insight into OA progression pathways, with utility to support interventions targeting current or predicted individual functional needs.

GRAD STUDENT – PHD BME

CARBON FOOTPRINT REDUCTION ASSOCIATED WITH A SURGICAL OUTREACH CLINIC

Chad Purcell, David Forner, Victoria Taylor, Christopher W. Noel, Larry Pan, Matthew Rigby, Martin Corsten, Jonathan R. Trites, Antoine Eskander, Ted McDonald, S. Mark Taylor

OTOLARYNGOLOGY

BACKGROUND: Healthcare provision and large institutions contribute substantially to carbon emissions. Carbon footprint can quantify carbon emission contributions from individuals and groups. Outreach clinics and mobile health units have been shown to improve health outcomes, reduce patient travel time and costs. However, no previous study has assessed the impact of outreach clinics on carbon footprint reduction. The purpose of this study is to estimate the carbon footprint reduction associated with a head and neck surgical oncology outreach clinic.

METHODS: Participants completed a self-administered survey of 12 items eliciting travel distance, vehicle details, and ability to combine medical appointments when travelling to the outreach clinic compared with appointments at the nearest regional centre. Canadian datasets of manufacturer provided vehicular efficiency were used to estimate carbon emissions for each participant. Geographic information systems were used for analyses.

RESULTS: 113 patients were included for analysis. Most patients (85.8%) travelled to the outreach clinic in their own personal vehicle. The median distance to the clinic and regional centre were 29.0 kilometers (IQR 6.0 – 51.9) and 327.0 kilometers (IQR 309.0 – 337.0) respectively. The mean carbon emission reduction per person was 117,495.4 grams (SD: 29,040.0) to 143,570.9 grams (SD: 40,236.0). This represents up to 2.5% of an average individual's yearly carbon footprint. Fewer than 10% of patients indicated they were able to carpool or group their appointments.

CONCLUSION: Surgical outreach clinics decrease carbon footprints associated with patient travel compared to continued care at a regional centre. Further research is needed to determine possible interventions to further reduce carbon emissions associated with the surgical care of patients.

RESIDENT – ENT PGY 2

QUANTITATIVE EVALUATION OF PROPRIOCEPTION AFTER UPPER EXTREMITY AGONIST-ANTAGONIST MYONEURAL INTERFACE

Rakesh Gudimella, Yajun Pan, Rob Adamson, David Tang

PLASTIC SURGERY

BACKGROUND: Agonist-antagonist myoneural interface (AMI) is a surgical technique for improving proprioception after amputation. AMI involves joining agonist and antagonist tendon pairs over a synovial surface to restore gliding motion. Lower extremity AMI has been reported to improve prosthesis embodiment and function but has not been done in the upper extremity and proprioception has not yet been quantitatively evaluated. We performed the first known upper extremity AMI procedure and use a force-matching experiment to quantitatively compare proprioception in the AMI patient to control groups of standard transradial amputation and no amputation.

METHODS: Participants wear a forearm surface force myography armband, which measures muscle contraction to move a ball into a target displayed on a computer for visual feedback. When participants learn the force needed to move the ball into the target, they reapply the same force without visual feedback. If proprioception is poor, the participants cannot match the target force with the applied force when the ball is not visible. This is repeated for 300 trials per participant using two target forces. Linear regression of target versus applied force is done to measure accuracy, and correlation coefficients are compared using Grubbs' test to detect whether the AMI patient was an outlier from the control groups.

RESULTS: The AMI amputee ($r = 0.9688$) outperforms the standard amputee ($r = 0.6557$) and compares favourably to no amputation ($r = 0.9796$) from a pilot experiment.

CONCLUSION: AMI appears to improve proprioception as measured by force matching accuracy compared to standard transradial amputation. AMI may improve prosthesis function in amputees and warrants further study.

RESIDENT – PLASTIC SURGERY PGY 4 CIP

PREDICTING HOSPITAL ACUTE LENGTH OF STAY (LOS) BASED ON FIVE HOSPITALS IN NOVA SCOTIA

Marzie Saghayi, Lynn Lethbridge, JoAnne Douglas, Michael Dunbar, Stan Matwin

ORTHOPAEDICS/COMPUTER SCIENCE

BACKGROUND: Knee and hip replacements are common surgical techniques for treatment of osteoarthritis. Although statistics suggest that on average these operations have satisfactory outcomes, a noticeable portion of patients rate their experience unacceptable. Therefore, it is important to investigate and discover the variables that are impactful on the outcome of arthroplasty surgeries. LOS is widely used as an indicator for hospitals' performance. Optimizing the influential factors for reducing required LOS not only improves the patients' quality of care but also is a relief to the possibly limited number of resources available in a healthcare system and the workload in hospital management

METHODS: Machine learning analysis techniques have been systematically applied on patient and facility characteristics from five hospitals in Nova Scotia from 2011 to June 2017.

RESULTS: About 95% of surgeries are performed on senior patients (50 years old and above). The majority of the patients are women. They are also more susceptible to have a prolong LOS compared to men. Most patients who waited a long time for their surgery or had more than three comorbidities experienced prolong LOS. On average patients with hip surgery experienced a longer LOS. The frequency of patients who experience prolong LOS is decreased over the years. Among various machine learning algorithms that we tried for predicting LOS, Random Forest shows the best generalized performance for both LOS classification and regression.

CONCLUSION: These outcomes could help taking administrative decisions in order to optimize the exploitation of resources, lower the costs of healthcare and help patients health in general.

GRAD STUDENT – PHD COMPUTER SCIENCE

A CASE SERIES OF LOCALLY DELIVERED ANTIBIOTICS TO PORCINE SUBMUCOSA HERNIA GRAFT IN SINGLE STAGE REPAIR OF INCISIONAL HERNIA IN CONTAMINATED SETTINGS

Pooja Patel, Ashley Drohan, Lisa Julien, Samuel Minor

GENERAL SURGERY

BACKGROUND: Patients with incisional hernia repair in contaminated surgical fields represent a population with a high risk of post-operative infection, morbidity, and mesh explantation. Local delivery of antibiotics directly onto the mesh is a novel concept where two newly developed forms include gentamicin/PGLA discs and calcium sulfate antibiotic impregnated (vancomycin and gentamycin) beads (CSAB).

METHODS: This is a prospective case series of consecutive patients by a single surgeon who underwent single stage incisional hernia repair with porcine submucosa hernia graft in grade 3 Ventral Hernia Working Group Modified Scale wounds combined with gentamicin/PGLA discs or CSAB. The objective of this study was to identify the rates of surgical site infection, hernia recurrence, and safety-levels of systemic antibiotic absorption. Descriptive statistics were utilized for data analysis.

RESULTS: Thirty-two patients were enrolled using gentamicin/PGLA discs (N=10) and CSAB (N=22). The average defect width was 15.05 cm (range 5-25 cm), and length was 18.33 cm (range 7-35 cm). On post-operative day one, patients had low systemic gentamycin (CSAB mean=1.20 mg/L; gentamycin/PGLA discs mean=1.11 mg/L) and vancomycin levels (mean=3.27 mg/L). Mean follow up time was 16 months (range 2-52 months). Seven patients developed culture positive wound infections (CSAB=22.72%; gentamycin/PGLA discs=20.0%). Five infections involved the hernia graft and two were superficial. One mesh infection required explant secondary to an anastomotic leak. All other infections were treated conservatively with percutaneous drainage or wound packing and antibiotics. Three patients developed hernia recurrence (10%) and one underwent repeat operative repair.

CONCLUSION: Gentamicin/PGLA discs and CSAB are promising novel technologies allowing for delivery of local antibiotics with low systemic absorption and lower rate than reported in literature for surgical site infection and hernia recurrence.

RESIDENT – GENERAL SURGERY PGY 2

ASSOCIATION OF BMI AND WAIST CIRCUMFERENCE WITH KNEE ARTHROPLASTY CANDIDACY

Margaret Sun, Matthew J Kivell, Glen Richardson, Lynn Lethbridge, Hilary Macdonald, Sara Whynot, Michael J Dunbar

ORTHOPAEDICS

BACKGROUND: Morbid obesity is a well-known risk factor for complications after total knee arthroplasty (TKA). While some surgeons have implemented Body Mass Index (BMI)-based eligibility criterion for TKA, BMI alone is an insufficient biomarker of visceral adiposity. The purpose of this study was to determine whether assessment of visceral obesity using BMI and waist circumference is associated with discrimination between surgical or non-surgical TKA candidates.

METHODS: Patients with knee osteoarthritis referred to two orthopedic surgeons from 2014- 2017 were assigned to surgical or non-surgical groups. Univariate and multivariate associations ($\alpha = 0.05$) were analyzed between groups for BMI, BMI > 30 kg/m² (obese), waist circumference, or high waist circumference (females ≥ 105 cm, males ≥ 110 cm), with base variables combined for multivariate analyses.

RESULTS: Of the 217 subjects (mean age 64.5, 40% male, mean BMI 33.1), 51% were assigned to the surgical group. Univariate analyses showed each point increase in BMI increased the odds of being selected for surgery by 5% ($p=0.013$), and each point increase in waist circumference increased the odds of being selected for surgery by 2% ($p=0.031$). When combined with base variables, BMI and waist circumference remained significant ($p=0.049$, $p=0.048$, respectively). BMI > 30 kg/m² and high waist circumference were not significantly associated with surgical candidacy independently or when combined with base variables.

CONCLUSION: Higher BMI and waist circumference were positively associated with TKA candidacy while BMI > 30 kg/m² and high waist circumference were not. Future studies will examine association of post-operative complications and BMI stratification with waist circumference to elucidate its use in determining surgical candidates.

MEDICAL STUDENT