8:15 AM - Chair: Dr. Daniel French

Submental Liposuction for the management of lymphedema following head and neck cancer treatment: a randomized controlled trial.
Uthman Alamoudi

Cytoplasmic RNA stress granules: A Putative Translational Mechanism of mTOR Regulation in Glioblastoma.
Kathleen Attwood

Development and Characterization of Decellularized Human Nasoseptal Cartilage Matrix for Use in Tissue Engineering.
Elise Graham

Inhibition of Breast Cancer Cell Growth, Metastasis and Angiogenesis by Phloridzin Docosahexaenoate.
Wasundara Fernando

Pressure Ulcer Prevention: How do Perceptions on Prevention and Current Initiatives Relate to Actual Pressure Ulcer Prevalence?
Alison Wong

Risk Factors For Infection, Revision, Mortality, Blood Transfusion, and Longer Hospital Stay After Primary Total Hip or Knee Arthroplasty at 3 Months And 1 Year Postoperatively.
Chanseok Rhee

Intratumoural IL-15-Immunotherapy for the Treatment of Cutaneous Metastatic Melanoma.
Mark Hanes

Predictors of Need for Surgical Intervention and Surgical Outcomes in Neonates with Cystic Fibrosis.
Sam Jessula

Online Adult Tonsillectomy Resources: Are Patients Getting Reliable and Readable Recommendations?
Faisal Alzahrani

BREAK

10:45 AM

Chair: Dr. Jason Williams

Rates of Re-Excision Following Breast Conserving Surgery.
Ashley Drohan

Hip Arthroplasty with Cemented Femoral Fixation for the Treatment of Femoral Neck Fracture Results in Lower Rates of Mortality, Fracture & A Higher Rate of Direct Home Discharge Compared to Uncemented Femoral Fixation.
Daryl Dillman

Intra-Tumoral Gemcitabine is Superior to Systemic Treatment in Preventing Lung Metastasis and Reducing Circulating Tumor Cells (CTC's) in a Modified 4T1 Murine Breast Cancer Model.
Edward Mathenge

Failing to Follow-Up: Poor Adherence to Radiology Recommendations for Follow-Up Imaging in Head and Neck Cancer Patients.
Devin Piccott

Analysis of Prognostic and Predictive Effects of KRAS Mutation Status in Early Stage Non Small Cell Lung Cancer.
Pejman Sadeghi

A Formalized Shared Decision Making Process with Individualized Decision Aids Improves Comprehension and Decisional Quality Among Frail, Elderly Cardiac Surgery Patients.
Ryan Gainer

Graft Utilization in the Augmentation of Large-to-Massive Rotator Cuff Repairs: A Systematic Review.
Devin Ferguson

Mast Cell Relevance to Cardiac Fibrosis: *in vitro* and *ex vivo* Perspectives.
Stephanie Legere

Lunch

1:30 PM

Chair: Dr. Carman Giacomantonio

Identification of Approved Drugs Altering Stress Granule Dynamics and Implications in Glioblastoma Therapy.
Aaron Robichaud

Changes in Circulating Monocyte Subsets (CD16 Expression) and Neutrophil-to-Lymphocyte Ratio observed in Patients Undergoing Cardiac Surgery.
Kareem Gawdat

All Patients with a Giant Hiatal Hernia Require Referral to a Surgeon.
Alexander Ednie

Safety of a Far Medial Arthroscopic Portal for Arthroscopic Anatomic Glenoid Reconstruction – A Cadaveric Study.
Justin Moga

Nuclear Atypia on Fine Needle Aspirate is Not Associated with an Increased Risk of Thyroid Cancer.
Ayman Al Afif

Free Flap Breast Reconstruction: No Increased Risk of Blood Transfusion with Use of Anti-platelet and Anti-coagulant Therapy.
Justin Pyne

Shared Decision-Making During Surgical Consultation: An Observational Study in Pediatric Otolaryngology.
Jonathan Melong

Break

3:15 PM

Chair: Dr. Thomas Issekutz

Why the P-Value Alone is not Enough: The Need for Confidence Intervals in Plastic Surgery Research.
Osama Samargandi

A Modified Delphi Study For The Design and Validation of Key Text Messages (Tonsil-Text-To-Me) To Improve Parent and Child Perioperative Tonsillectomy Experiences.
Jin Soo Andy Song

Colonoscopy Competency among Senior General Surgery Residents.
Riley Stewart

Delayed New-Onset Hormone Dysfunction Following Complete and Incomplete Resection of Nonfunctioning Pituitary Adenomas.
Jae Ho Han

Growth Friendly Surgery (GFS) Versus Casting for the Treatment of Early Onset Scoliosis (EOS) in Patients with Prader-Willi Syndrome (PWS).
Jonathan Oore

Nanoparticle-Encapsulated Piperlongumine Modulates Metastatic Processes in Triple-Negative Breast Cancer Cells.
Javad Ghassemi Rad

The Effect of Strontium Citrate on Bone Consolidation during Mandibular Distraction Osteogenesis in a Rabbit Model.
Ben Taylor

End – Reception

SUBMENTAL LIPOSUCTION FOR THE MANAGEMENT OF LYMPHEDEMA FOLLOWING HEAD AND NECK CANCER TREATMENT: A RANDOMIZED CONTROLLED TRIAL.

Uthman Alamoudi, B Taylor, M Rigby, R Hart, J Trites, SM Taylor

Otolaryngology

BACKGROUND: ***Objective:*** The purpose of our study was to review the outcomes of head and neck cancer patients at our center who have undergone submental liposuction for post-treatment lymphedema as compare quality of life outcomes with a control group.

Study Design: Randomized controlled trial.

Subjects: 18 head and neck cancer patients treated with surgery and/or chemoradiotherapy with resultant submental lymphedema

METHODS: We assessed the change in the DAS (Derriford appearance scale)) and BOER (modified blepharoplastly outcome evaluation) scores of the treatment and non-treatment groups.

RESULTS: The mean difference in DAS score in the non-treatment group was 8.56 and -35.78 in the treatment group, indicating that those who had surgery reported greater satisfaction with their appearance post-surgery than those who were observed for 6 months. The mean difference was 44.3 (95% CI 21.5-67.1). This difference was significant with a p-value of 0.001 at a confidence interval of 95%. The mean difference in BOER score in group 0 was -0.11 and 1.4 in group 1, once again indicating that those who had surgery reported greater satisfaction with their appearance post-surgery than those in the control group. The mean difference was -1.51 (95% CI -2.3 – -0.70). The difference is significant ($p < 0.001$ [CI 95%]).

CONCLUSION: Our study demonstrated a statistically significant improvement in patients' self-perception of appearance and objective scoring of appearance following submental liposuction when compared to controls.

CYTOPLASMIC RNA STRESS GRANULES: A PUTATIVE TRANSLATIONAL MECHANISM OF mTOR REGULATION IN GLIOBLASTOMA.

Kathleen Attwood, S Whitehouse, A Robichaud, J Rutka, A Weeks

Neurosurgery

BACKGROUND: RNA stress granules are a novel form of translational control observed in GBM cells that could potentiate treatment resistance.

METHODS/RESULTS: We performed RNA immunoprecipitation followed by microarray profiling of mRNAs pulled down by stress granule (SG) markers TIAR and G3BP1 in normal and oxidative stress conditions to enrich for mRNA contained in SGs during stress in glioblastoma cell lines. Interestingly, components of the mTOR Ragulator, RRAGD and LAMTOR were enriched in G3BP1 precipitates in stress conditions. This is significant as mTOR is a major oncogene in GBM and the Ragulator complex activates mTOR. We therefore hypothesize that Ragulator mRNAs are sheltered in SGs for rapid translation after stress release. We confirmed that protein levels of RRAGD and LAMTOR increase at 25-35 minutes post-release from arsenite induced stress concomitant with a 50% decrease in SGs. We also observed similar increases in protein levels of other Ragulator components (RRAGA/B/C). This increase differed from protein levels of other mRNAs identified in our screen, which showed no increase in protein levels after stress release (TIAM1, WAVE1/2, FOXK2, FOXN3). The increase in protein levels of the Ragulator complex components remained despite the addition of actinomycin D, suggesting that the increase protein levels are a result of translation of a stabilized cohort of mRNA and not *de novo* transcription. Interestingly, mTOR activity increases at 30-40 minutes, corresponding to the increase protein levels in the Ragulator.

CONCLUSIONS: Taken together, this data suggests a novel translational control mechanism of mTOR activation by SGs and reveal SGs as potential therapeutic targets. We are currently engineering CRISPR constructs against known SG components to study this possibility.

DEVELOPMENT AND CHARACTERIZATION OF DECELLULARIZED HUMAN NASOSEPTAL CARTILAGE MATRIX FOR USE IN TISSUE ENGINEERING

M. Elise Graham, PF Gratzer, M Bezuhly, Paul Hong

Otolaryngology

BACKGROUND: Reconstruction of cartilage defects in the head and neck can require harvesting of autologous cartilage grafts, which can be associated with donor site morbidity. To overcome this limitation, tissue-engineering approaches may be used to generate cartilage grafts. The objective of this study was to decellularize and characterize human nasoseptal cartilage with the aim of generating a biological scaffold for cartilage tissue engineering.

METHODS: Remnant human nasoseptal cartilage specimens were collected and subjected to a novel decellularization treatment. The decellularization process involved several cycles of enzymatic detergent treatments. For characterization, decellularized and fresh (control) specimens underwent histological, biochemical, and mechanical analyses. Scanning electron microscopy and biocompatibility assay were also performed.

RESULTS: The decellularization process had minimal effect on glycosaminoglycan content of the cartilage extracellular matrix. Deoxyribonucleic acid (DNA) analysis revealed the nearcomplete removal of genomic DNA from decellularized tissues. The effectiveness of the decellularization process was also confirmed on histological and scanning electron microscopic analyses. Mechanical testing results showed that the structural integrity of the decellularized tissue was maintained, and biocompatibility was confirmed.

CONCLUSION: Overall, the current decellularization treatment resulted in significant reduction of genetic/cellular material with preservation of the underlying extracellular matrix structure. This decellularized material may serve as a potential scaffold for cartilage tissue engineering.

INHIBITION OF BREAST CANCER CELL GROWTH, METASTASIS AND ANGIOGENESIS BY PHLORIDZIN DOCOSAHEXAENOATE

Wasundara Fernando, E Maclean, H.P. Vasantha Rupasinghe, David W. Hoskin

Pathology

BACKGROUND: Natural-source flavonoids have health benefits; however, flavonoid bioavailability is typically low due to the decreased cellular uptake. Recently, we synthesized docosahexaenoic acid-acylated phloridzin (PZ-DHA) from apple peel-derived phloridzin (PZ) and the omega-3 fatty acid docosahexaenoic acid (DHA), with the aim of improving the pharmacodynamics of PZ and reducing auto-oxidation of DHA.
METHODS: Cytotoxicity of PZ-DHA towards mammary carcinoma cell lines (MDA-MB-231, MDA-MB-468, MCF-7, T-47D, 4T1) was tested in comparison to normal epithelial cells (HMEC, MCF-10A) and fibroblasts using MTS assays and flow cytometric analysis of Annexin-V-FLUOS/propidium iodide (PI)-stained cells. Cytotoxicity toward MCF-7 spheroids was evaluated using acid phosphatase assays. Staining with Oregon Green 488, fluorescein isothiocyanate-labeled anti-Ki-67 antibody, or PI was used to investigate the antiproliferative activity of PZ-DHA against MDA-MB-231 cells. The antimetastatic and antiangiogenic activities of PZ-DHA were assessed using gap closure and migration/invasion assays with MDA-MB-231 and 4T1 cells, and tubule formation assays with endothelial cells, respectively. The antimetastatic efficacy of PZ-DHA was tested in immune-competent mice implanted with syngeneic 4T1 cells, and immunodeficient female mice implanted with green fluorescence protein tagged-MDA-MB-231 cells.
RESULTS: PZ-DHA selectively killed mammary carcinoma cells and arrested their division at G2/M phase. PZ-DHA also reduced the growth of MCF-7 spheroids, inhibited breast cancer cell migration and invasion, and suppressed mammary carcinoma metastasis in mice. In addition, sub-cytotoxic doses of PZ-DHA interfered with tubule formation by endothelial cells.
CONCLUSION: This study reveals that PZ-DHA suppresses mammary carcinoma cell proliferation and metastasis, as well as angiogenesis, suggesting utility for the prevention of breast cancer progression in patients.

PRESSURE ULCER PREVENTION: HOW DO PERCEPTIONS ON PREVENTION AND CURRENT INITIATIVES RELATE TO ACTUAL PRESSURE ULCER PREVALENCE?

Alison L. Wong, GS Walia, R Bello, CS Aquino, Justin M. Sacks

Plastic Surgery

BACKGROUND: Hospital acquired pressure ulcers (HAPUs) remain a significant problem despite numerous prevention initiatives. We hypothesized that healthcare professionals' perceptions of the importance of HAPU prevention would therefore not be correlated with HAPU prevalence but that there would be low perceived effectiveness and satisfaction of existing initiatives.
METHODS: An online survey was developed using the AHRQ Views on Pressure Ulcer Prevention validated survey with additional questions on perceived effectiveness and satisfaction of existing initiatives. The survey was distributed electronically to nurses, residents and attending physicians across all inpatient and perioperative departments at an academic hospital. The results of the survey were then compared to quarterly HAPU prevalence data by unit.
RESULTS: In total 839 healthcare professionals completed the survey (579 nurses, 131 residents, 119 attending physicians). The mean score for the AHRQ survey was 42.5 (≥40 denoting positive perceptions). There was a statistically significant difference between professions ($P < 0.01$) and no interaction between profession and unit ($P = 0.462$; HAPU prevalence ranged from 1-29%). There was not a significant correlation between AHRQ scores and prevalence of HAPUs ($r = -0.60$, $P = 0.402$). Repositioning was felt to be the most effective intervention (4.54 ± 0.64), while educational posters were felt to be the least effective (3.31 ± 0.99). Respondents generally rated satisfaction much lower, with no single initiative significantly better than the others (range 3.21-3.79). Perceived effectiveness and satisfaction were all positively correlated.
CONCLUSION: High prevalence despite position perceptions suggest that prevention methods are not as effective as thought or they are not being used as widely as they should. Further research should take advantage of positive attitudes by prospectively investigating the effectiveness of novel interventions.

RISK FACTORS FOR INFECTION, REVISION, MORTALITY, BLOOD TRANSFUSION, AND LONGER HOSPITAL STAY AFTER PRIMARY TOTAL HIP OR KNEE ARTHROPLASTY AT 3 MONTHS AND 1 YEAR POSTOPERATIVELY.

Chanseok Rhee, Lynn Lethbridge, Glen Richardson Michael Dunbar

Orthopaedics

BACKGROUND: Total joint replacement (TJR) is increasingly performed in older and more comorbid patients who are considered high risk for postoperative complications. We identified and calculated the odds ratio of the risk factors for infection, revision and mortality at 3-months and 1 year after TJR, and also for postoperative blood transfusion and prolonged admission.

METHODS: We analyzed all primary hip and knee arthroplasty cases in Nova Scotia, Canada, during the fiscal years 2001-2013, as identified from the hospital Discharge Abstract Database. The Charlson co-morbidity index was used to identify medical conditions. Hospital and physician billings data as well as Nova Scotia Vital Statistics data were used to identify the postoperative events in this cohort.

RESULTS: 9,131 primary total hip arthoplasty (THA) and 15,432 primary total knee arthroplasty (TKA) cases were performed during the study period. Significant risk factors for infection were heart failure and diabetes for THA, and mild liver disease and transfusion for TKA. Revision rates were higher for patients with rheumatologic disease and paraparesis/hemiparesis for THA, and metastatic disease for TKA. Significant risk factors for mortality included metastatic disease, older age, heart failure, myocardial infarction, dementia, rheumatologic disease, renal disease, blood transfusion, and cancer. Multiple medical comorbidities and older age were associated with more blood transfusion and longer hospital admission.

CONCLUSION: The current study identified the risk factors associated with higher rates of postoperative complications and longer admission after TJR. The results from this study allow individualized risk stratifications during the preoperative consultation.

INTRATUMOURAL IL-15-IMMUNOTHERAPY FOR THE TREATMENT OF CUTANEOUS METASTATIC MELANOMA

Mark Robert Hanes, EG Mathenge, ML Thomas, M Giacomantonio, P Marcato, Carman Giacomantonio
Pathology

BACKGROUND: Administration of IL-2 intratumourally (i.t.) for the treatment of cutaneous metastatic melanoma (CMM) was approved by the pan-Canadian Oncology Drug Review in 2015. At the QEII hospital in Halifax, 56 patients with CMM were treated with i.t. IL-2-therapy; achieving 89% overall, and 44% complete, response rates with only grade one or two toxicities. However, the presence of metastases creates a challenge for local-therapies, particularly for IL-2 as it appears to have localised efficacy. IL-2 also promotes the generation and maintenance of regulatory T cells (T_{REGS}) that negate antitumour immune responses. Given these downfalls, we evaluated the therapeutic potential of IL-15 for the treatment of CMM. IL-15 selectively expands memory T cells that have increased ability to traffic to areas of inflammation (e.g. distant tumours). *Hypothesis*: Local IL-15-therapy will decrease distant tumour-burden due to increased memory T cell numbers.
METHODS: C57BL/6-mice bearing dual-hind flank B16F10-melanoma tumours were i.t. treated with PBS, IL-2, or IL-15 after establishment of right-flank tumours. Treatment was administered every two days for a total of three treatments, and mice were sacrificed one day after the final treatment. Immune infiltrates of tumours and secondary lymphoid organs (SLOs) were stained to identify T cell populations and quantified using flow cytometry.
RESULTS: I.t. IL-15-therapy significantly controlled treated-tumour and distant non-treated tumour growth compared to PBS and IL-2. IL-15 immunotherapy also enhanced the number of antigen-experienced $CD8^+$ T cells and $CD4^+$ T cells, effector memory T cells, and terminally differentiated effector T cells within treated-tumours and SLOs. Beneficially, IL-15 did not influence T_{REGS} within the tumours, ipsilateral lymph node, or spleen.
CONCLUSION: Intratumoural IL-15-immunotherapy significantly decreases local and distant melanoma-burden compared to PBS and IL-2.

PREDICTORS OF NEED FOR SURGICAL INTERVENTION AND SURGICAL OUTCOMES IN NEONATES WITH CYSTIC FIBROSIS

Samuel Jessula, M Van Den Hof, D Mateos-Corral, J Mills,
D Davies and Rodrigo Romao

General Surgery

PURPOSE: To identify risk factors for surgery and describe surgical findings/outcomes of neonates with meconium lieus (MI) secondary to cystic fibrosis (CF).

METHODS: Retrospective cohort study of neonates with CF presenting between 1997-2015 to a tertiary centre. Chi-square/exact tests were used to examine associations between possible risk factors (sex, prematurity, birthweight, genotype and prenatal bowel echogenicity) and development of MI. For patients requiring surgery, detailed operative findings and outcomes were examined.

RESULTS: MI was diagnosed in 26/120 (21.6%) neonates with CF and 19/26 (73%) required surgery. Prematurity and lower birthweight were significantly associated with increased risk of MI and operative intervention ($p<0.05$); genotype and echogenic bowel were not. Surgical data were available for 17/19 patients; median age at surgery was 2 days (IQR1-3), 5/17 had atresia and 7/17 received an ostomy. Median NICU and hospital stay were 34.5 and 70 days respectively, with no in-hospital mortalities; median time on TPN and time to ostomy reversal were 28.5 and 97 days respectively.

CONCLUSION: In patients with CF, prematurity and lower birthweight were identified as risk factors for meconium ileus and need for surgery. Specific genotypes and echogenic bowel were not predictors of either. Most patients requiring surgery did so early in life and almost 1/3 had an associated atresia.

ONLINE ADULT TONSILLECTOMY RESOURCES: ARE PATIENTS GETTING RELIABLE AND READABLE RECOMMENDATIONS?

Faisal Alzahrani, Lori Wozney, Paul Hong

Otolaryngology

BACKGROUND: Patient frequently refer to information on the Internet to confirm or broaden their understanding of surgical procedures and to research postoperative care practices. Our study evaluated the readability, reliability, comprehensiveness and strength of consensus around online recommendations directed at adult patients undergoing tonsillectomy.

METHODS: A cross-sectional design was used to assess 20 English language, patient-directed tonsillectomy websites. Three well-validated measures of readability were used and sites were screened for Health on the Net Foundation Code of Conduct (HONcode) certification. Content analysis was used to evaluate the comprehensiveness of information in domains of perioperative education. Frequency effect sizes and percentile ranks were calculated to measure how dispersed recommendations were across sites.

RESULTS: The mean readability level of all sites was a grade 10 or higher level with less than half of the sites (n=35%) scoring at or below the 8th grade level. Less than 25% of sites indicated HONcode certification. Provided information was often incomplete with a noted lack of psychosocial support and skills-training recommendations. Most recommendations had low consensus. Numerous contradictory recommendations were also identified.

CONCLUSION: Many online patients' tonsillectomy resources do not meet readability recommendations, portray incomplete education about perioperative care and expectations, and provide recommendations with low levels of consensus. Up to date mapping of the research evidence around recommendations is needed as well as improved efforts to make online information easier to read

RATES OF RE-EXCISION FOLLOWING BREAST CONSERVING SURGERY

Ashley Drohan and Lucy Helyer

General Surgery

BACKGROUND: Breast cancer is the most common malignancy in Canadian females. Surgical treatment options include breast-conserving surgery (BCS) and radiation therapy or mastectomy with or without reconstruction. Most women with early stage breast cancer will undergo BCS. The goal of BCS is to remove the tumor with negative margins while preserving as much normal breast tissue as possible. Until recently, there was no consensus on the optimal margin width for BCS, but it was accepted that about 25% of patients would need re-excision. In 2014, the SSO-ASTRO introduced guidelines stating “no tumor on ink” was adequate for early breast cancer. The purpose of this study was to describe the rates of re-excision at the IWK for DCIS/early breast cancer pre and post guideline implementation.

METHODS: This is a retrospective cohort study of all patients who underwent re-excision surgery Oct/2010-Oct /2011 (pre guideline) and Oct/2014-May/2016 (post guideline). Rates of re-excision were compared between time periods. Patient characteristics, pathology results, and postoperative outcomes were compared. Chi squared and Fishers exact tests were used for categorical data; T test and non-parametric tests were used for continuous data.

RESULTS: The rate of re-excision following BCS has significantly decreased post guideline implementation (13.83% (pre), 7.79% (post, p 0.02). Patient characteristics, pathology results and postoperative outcomes were similar between both groups.

CONCLUSION: There has been early adoption of the SSO-ATRO guidelines at the IWK. Re-excision rates at the IWK are much lower than what is quoted in the literature (20-25%).

HIP ARTHROPLASTY WITH CEMENTED FEMORAL FIXATION FOR THE TREATMENT OF FEMORAL NECK FRACTURE RESULTS IN LOWER RATES OF MORTALITY, FRACTURE AND A HIGHER RATE OF DIRECT HOME DISCHARGE COMPARED TO UNCEMENTED FEMORAL FIXATION

Chanseok Rhee, **Daryl Dillman**, Lynn Lethbridge, Glen Richardson
Michael Dunbar

Orthopaedics

BACKGROUND: Cemented and uncemented femoral fixation are commonly performed in hip arthroplasty to treat femoral neck fracture. We compared these two fixation methods in terms of postoperative mortality, fracture, revision, and disposition facilities.

METHOD: We analyzed all cases of hip arthroplasty performed for the treatment of femoral neck fracture in Nova Scotia during the years 2001-2014. These procedures were divided into cemented and uncemented femoral fixation categories based on CCHI codes. Hospital and physician billings data were used to compare postoperative mortality, fracture, revision, and disposition facilities.

RESULTS: 53.5% of the 4750 procedures used cemented femoral fixation. The overall mortality rates at 30 days, 90 days and 1 year postoperatively were 7.7%, 13.2% and 23.9%, respectively. Cemented hip replacement showed significantly lower mortality rates at all points, with odds ratios of 0.67 ($p=0.0008$), 0.56 ($p<0.0001$) and 0.56 ($p<0.0001$) for 30 days, 90 days and 1 year. The fracture rate was significantly lower in the cemented group with odds ratio of 0.52 ($p=0.018$). Patients who underwent cemented hip replacement were more likely to be discharged home instead of extended-care facilities with an odds ratio of 1.62 ($p<0.0001$).

CONCLUSION: Thirteen year comprehensive administrative data from a single Province demonstrates significantly lower rates of mortality, fracture, and also a higher rate of direct home discharge among patients treated with hip arthroplasty utilizing cemented femoral fixation compared to those treated with uncemented fixation.

INTRA-TUMORAL LOW-DOSE GEMCITABINE IMPACTS THE TUMOR MICROENVIRONMENT DIFFERENTLY AND IS SUPERIOR TO SYSTEMIC GEMCITABINE IN SUPPRESSING EARLY CTCS AND LUNG METASTASIS IN A MODIFIED 4T1 MURINE BREAST CANCER MODEL.

Edward G. Mathenge, D Clements, M Hanes, MThomas, N Holay, Y Kim, B Kennedy, P Marcato, S Gujar, Carman A. Giacomantonio

Pathology

BACKGROUND: Previously we demonstrated that diagnostic core-needle biopsies increase levels of lung metastasis in a murine breast cancer model. Evidence suggests post-biopsy increase in MDSCs in the tumor microenvironment are part of an immune associated pathway driving a metastatic phenotype. Our study uses Gemcitabine (GEM), an MDSC depleting chemotherapeutic, to test if MDSC depletion, through local or systemic GEM, can reduce metastasis.

METHODS: A modified 4T1+Balb/c murine breast cancer model was developed (4T1 cells modified to express a Neomycin cassette, allowing qPCR quantitation). At 6-9mm tumor size mice were divided into groups receiving biopsy and different treatments. Comparison of systemically administered Gemcitabine (SYS.GEM) (120 mg/Kg), and low-dose intra-tumorally administered Gemcitabine (low-IT.GEM) (40mg/Kg) was also conducted.

Tumor growth and animal weight were monitored. Tissue and blood was harvested from the mice at days 3 and 7 post-biopsy (p.b.). FACS analysis and qPCR were performed to evaluate immune-cellular population changes, gene expression, CTC and metastasis levels.

RESULTS: Tumor growth and body weight were suppressed by Gemcitabine treatment. Additionally, mice receiving low-IT.GEM neoadjuvant showed suppressed circulating tumor cells (CTCs) and lower early metastasis levels than SYS.GEM mice.

Both SYS.GEM and low-IT.GEM increased inflammatory cytokine gene expression and reduced splenic MDSCs to naïve levels by day 3 p.b. However, in the tumor microenvironment low-IT.GEM, and not SYS.GEM, supressed MDSCs by day 7 p.b.

By day 3 p.b., CTC levels were significantly lower in low-IT.GEM mice than SYS.GEM. Lung metastasis was also significantly lower in low-IT.GEM mice.

CONCLUSION: With CTC levels >4 times lower for low-IT.GEM than SYS.GEM and superior metastasis suppression by low-IT.GEM there is value in exploring Low IT.GEM as a neoadjuvant at diagnostic and treatment initiation.

FAILING TO FOLLOW-UP: POOR ADHERENCE TO RADIOLOGY RECOMMENDATIONS FOR FOLLOW-UP IMAGING IN HEAD AND NECK CANCER PATIENTS

Devin Piccott, MH Rigby, SM Taylor, J Trites, J Heidenreich, R Hart

Otolaryngology

BACKGROUND: Computed Tomography is regularly used in the staging and workup of patients with suspected head and neck malignancy. Often incidental findings are discovered and recommendations are made for future radiologic follow-up. There is no known evidence regarding adherence to follow-up of radiologist-recommendations in head and neck cancer patients.

METHODS: A retrospective cohort study of 500 patients with suspected head and neck cancer was performed. Radiology reports were reviewed for recommendations and electronic medical records were analyzed for outcomes. The primary outcome was adherence to recommendations within 60 days of the radiologist-recommended follow-up period. Secondary outcomes looked into the consequences of follow-up. Of the 500 patients reviewed, 456 met inclusion criteria.

RESULTS: Of the 456 patients included, 109 (24%) had recommendations for follow-up imaging. Of these 109 patients, 48% received appropriate follow-up in terms of imaging modality and time frame, 13% received follow-up outside of the 60-day period, and 39% did not receive any radiologic follow-up at all. 12% patients who didn't receive appropriate follow-up died and 88% had an unknown outcome. Of those who received appropriate follow-up, 40% received a recommendation for further interval imaging, 17% had concern for metastasis, 15% had resolution of their previously concerning findings and 10% required biopsy.

CONCLUSIONS: There is a concern regarding lack of adherence to follow-up recommendations in head and neck cancer patients. In our study, approximately half of all patients did not receive appropriate follow-up. There is evidence that failing to appropriately follow-up on recommendations may lead to poor patient outcomes.

ANALYSIS OF PROGNOSTIC AND PREDICTIVE EFFECTS OF KRAS MUTATION STATUS IN EARLY STAGE NON SMALL CELL LUNG CANCER

Pejman Sadeghi & Madelaine Plourde

General Surgery

BACKGROUND: Lung cancer is the leading cause of cancer mortality among Canadians. Recent discovery of new mutations in EGFR, KRAS and ALK gene in a subgroup of non small cell lung cancer (NSCLC) patients have opened a new field of research to develop new targeted chemotherapy. Prognostic effects of KRAS status in NSCLS is still not clear. Also, there is data to suggest an increased rate of metachronous NSCLC in presence of KRAS oncogenic mutations. This could potentially have clinical implications in designing post operative surveillance protocols.

METHODS: This is a retrospective study that included Nova Scotians who were diagnosed with early stage (stage I and II) NSCLC and underwent lung resection with curative intent at our institution from January 1st 2006 to Dec 31st 2015. All specimens underwent molecular testing and KRAS status has been determined. Primary outcome was overall survival. Secondary outcomes were disease free survival and rate of new primary NSCLC. Other variables including age, Charlson comorbidity index and complications have been extracted from charts.

RESULTS: In our cohort 83 patients had KRAS mutations. Primary analysis of our data shows no significant difference in survival times between the kras-positive, and kras-negative groups (log rank test P=0.88). Also, the rate of second primary NSCLC was not significantly different between the two groups (Pearson chi-squared test P=0.28). Two groups were similar in terms of age and Charlson index.

CONCLUSION: Based on our preliminary analysis, KRAS status has no prognostic effects on early stage NSCLC. Moreover, it does not affect the rate of new primary NSCLC in survivors.

A FORMALIZED SHARED DECISION MAKING PROCESS WITH INDIVIDUALIZED DECISION AIDS IMPROVES COMPREHENSION AND DECISIONAL QUALITY AMONG FRAIL, ELDERLY CARDIAC SURGERY PATIENTS

Ryan A. Gainer, J Begum, E Wilson-Peace, Gregory M. Hirsch

Cardiac Surgery

BACKGROUND: Comprehension of risks, benefits, and alternative treatment options is poor among patients referred for cardiac surgery interventions. The objective of the current study is to explore the impact of a formalized shared decision making (SDM) on patient comprehension and decisional quality among elderly patients referred for cardiac surgery.
METHODS: A formalized SDM process was established including a paper-based decision aid and evaluated within the context of a pre-post study design. Surgeons were trained in SDM through a web based programme. Patients undergoing isolated valve, CABG or CABG+Valve surgery were eligible. Participants in the pre-intervention phase (n=100) underwent usual consent discussions. Participants in the interventional group (n=100) were presented with a decision aid following the decision to refer for surgery, populated with individualized risk assessment, personal profile, and co-morbidity status. Both groups were assessed following consent but prior to surgery. Primary outcomes were comprehension and decisional quality scores.
RESULTS: Patients in the interventional group scored higher in comprehension (median: 15.0; IQR: 12.0-18.0) compared to those who did not (median: 9.0; IQR: 7.0-12.0) ($p < 0.001$). Decisional quality was greater in the interventional group (median: 82.2; IQR: 73.0-91.0) compared to those in the pre-intervention group (median: 75.6; IQR: 62.0-82.0) ($p<0.05$). Decisional conflict scores were lower in the post-intervention group (mean:1.76, SD 1.14) compared to those in the pre-interventional group (mean:5.26, SD: 1.02) ($p<0.05$). Anxiety and depression scores showed no significant difference between pre-intervention (median: 9.0; IQR: 4.0-12.0) and post-intervention groups (median: 7.0; IQR: 5.0-11.0) ($p<0.28$).
CONCLUSION: Institution of a formalized SDM process including individualized decision aids improve comprehension of risks, benefits and alternatives to cardiac surgery, decisional quality, and did not result in increased levels of anxiety.

GRAFT UTILIZATION IN THE AUGMENTATION OF LARGE-TO-MASSIVE ROTATOR CUFF REPAIRS: A SYSTEMATIC REVIEW

Devin P Ferguson, MR Lewington, TD Smith & Ivan H Wong

Orthopaedics

BACKGROUND: Current treatment of symptomatic large-to-massive rotator cuff tears can reduce pain; however, failure remains high. Surgeons have incorporated grafts to augment repairs with promising results. Multiple reviews summarize these products; however, no systematic review investigates the grafts ability to maintain structural integrity following repair.

METHODS: A comprehensive search of 4 reputable databases was completed. Inclusion criteria: 1) large-to-massive rotator cuff tears; 2) graft augmentation of primary repairs +/- primary repair control group; 3) minimum clinical and radiological follow-up of 12 months. Two reviewers screened titles, abstracts, and full articles. Results were summarized into evidence tables stratified by graft origin and level of evidence.

RESULTS: Ten studies were included. Allograft augmentation was functionally and structurally superior to primary repair controls, with intact repairs in 85% vs. 40% of patients ($p < 0.01$). This is supported by observational study data. Xenograft augmentation failed to demonstrate superiority to primary repair controls, with worse structural healing rates (27% vs. 60%; $p = 0.11$). Both comparative studies support this finding. There have also been many reports of inflammatory reactions with xenograft use. Polypropylene patches are associated with improved structural (83% vs. 59% and 49%; $p < 0.01$) and functional outcomes when compared to controls and xenograft augmentation, however randomized data is lacking.

CONCLUSION: Augmentation of large-to-massive rotator cuff repairs with human dermal allografts is associated with superior functional and structural outcomes compared to primary repairs. Xenograft augmentation failed to demonstrate a statistically significant difference, and was associated with worse re-rupture rates and severe inflammatory reactions. Polypropylene patches have promising results. Research in this field is limited, future researchers should develop prospective, randomized-controlled trials to establish clear recommendations.

MAST CELL RELEVANCE TO CARDIAC FIBROSIS: *IN VITRO* AND *EX VIVO* PERSPECTIVES

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Microbiology & Immunology

BACKGROUND: Cardiac fibrosis promotes heart failure in cardiovascular disease and is initiated by inflammatory processes. Mast cells are immune cells present in the heart that initiate inflammatory responses to injury. After myocardial injury, interleukin(IL)-33 secretion has been shown to have cardioprotective effects. Mast cells express the IL-33 receptor, ST2 and respond to IL-33 treatment by producing mediators with relevance to cardiac fibrosis. We hypothesize that IL-33 acts on mast cells in cardiac tissue to induce production of mediators that promote resolution of tissue injury without excessive fibrosis.

METHODS: Human atrial tissue samples were obtained from patients undergoing cardiac surgery. Mast cells were identified using toluidine blue staining and fibrosis quantified through hydroxyproline assay. Atrial tissue samples were processed for analysis of mediator content. Human cord blood-derived mast cells (CBMCs) were activated *in vitro* with IL-33 for protein production of selected mediators.

RESULTS: Mast cells were identified in all 38 atrial samples ranging from 1.62 to 30.54 mast cells/mm2 of tissue. Patients with low (<10 mast cells/mm2) mast cell content were more likely to develop chronic heart failure than those with high (>10 mast cells/mm2) content. Atrial samples contained substantial amounts of IL-33, and detectable levels of several immune mediators (17.9 ± 2.6 pg GM-CSF, 134.2 ± 193.2 pg MMP-2, 92.8 ± 24.9 pg MMP-9 per mg protein, n=30). VEGF and CCL2 levels were positively correlated with fibrosis level ($r^2=0.257$, $p<0.01$, and $r^2=0.462$, $p<0.01$, respectively). CBMCs activated with IL-33 demonstrated increased production of TH2-associated cytokines (IL-13, IL-5) in addition to mediators associated with fibrosis (GM-CSF, VEGF).

CONCLUSION: IL-33 and mast cells in cardiac tissue may have an important influence on clinical outcomes in cardiac fibrosis.

IDENTIFICATION OF APPROVED DRUGS ALTERING STRESS GRANULE DYNAMICS AND IMPLICATIONS IN GLIOBLASTOMA THERAPY

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Neurosurgery

BACKGROUND: Glioblastoma, the most common primary brain tumour, caries a universally grim prognosis despite aggressive surgical and medical therapy. New targets are needed to sensitize these tumours to current treatments. Stress granules form in response to a number of cellular stressors, including hypoxia and certain types of radiation and chemotherapy. Altering the ability of glioblastoma cells to form or dissolve granules might sensitize them to current treatments. This study aims to identify currently approved drugs that can alter stress granule dynamics in glioma cells.

METHODS: The Prestwick drug library was used to investigate drug effects on stress granules in the setting of hypoxia. Each drug was administered to glioma cells. Cells were then stressed with hypoxia, and rates of granule formation and dissolution were compared between cells receiving drugs and those that did not using immunofluorescence and cellomics.

RESULTS: We identified 99 drugs that inhibit granule formation and 129 drugs that inhibit granule dissolution. These lists were narrowed down by calculating p values for the difference between averages of each well and control wells to select 10 drugs in each category for further investigation.

CONCLUSIONS: This project has provided drugs with the potential for altering stress granule dynamics in glioblastoma. Further testing will be done to determine if administration of these drugs in combination with conventional treatments increases rates of apoptosis or necrotic cell death. If successful, new treatments for glioblastoma will be identified for testing in mammalian models and clinical trials.

CHANGES IN CIRCULATING MONOCYTE SUBSETS (CD16 EXPRESSION) AND NEUTROPHIL-TO-LYMPHOCYTE RATIO OBSERVED IN PATIENTS UNDERGOING CARDIAC SURGERY

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Cardiac Surgery *

BACKGROUND: The characteristics of circulating inflammatory leukocytes in patients undergoing heart surgery remains poorly understood. Recently, neutrophil-to-lymphocyte ratio (NLR) and specific monocyte subsets have been suggested as markers of inflammation and predictors of outcomes. The present study aims to characterize the influence cardiac surgery with cardiopulmonary bypass (CPB) has on specific circulating leukocytes.

METHODS: All enrolled patients had blood samples taken pre (0d), early post, (5d), and late post (90d) surgery. Complete blood counts were performed and whole leukocyte isolations were obtained from blood samples fluorophore-linked antibodies (CD45, CD11b, CD14, CD16) were added to the blood cell isolations and later assessed by flow cytometry.

RESULTS: 17 patients were enrolled and samples obtained at 0d, 5d and 90d. We demonstrated a significant increase in NLR (2.2-fold; p=0.0028) and CD16-MFI (Mean Fluorescence Index-measure fluorescence intensity shift of CD16 in a gated cell population) early at d5 (2.0–fold; p=0.0051). There was a significant positive correlation between NLR and CD16-MFI (r2=0.29; p=0.0064). Adverse cardiovascular event (AE) was seen in 59% of patients. In an unadjusted analysis of AE we identified NLR as a likely predictor of AE, which meant that patients developing AE had a significantly higher baseline NLR (p=0.0065) something that was not observed with CD16-MFI (p=0.2541).

CONCLUSION: Cardiac surgery is associated with a significant increase in NLR and CD16-MFI (non-classical monocytes) early after surgery corresponding to the early inflammatory phase after surgery. Furthermore, we have for the first time identified a significant correlation between NLR and CD16-MFI. While this relationship remains unclear, our findings support the use of a simple test of NLR as a biomarker of inflammation for predicting outcomes in cardiac surgery patients.

ALL PATIENTS WITH A GIANT HIATAL HERNIA REQUIRE REFERRAL TO A SURGEON

Alexander Ednie & Danny French

General Surgery

BACKGROUND: A giant hiatal hernia is defined as having greater than 50% of the stomach herniated into the chest. Giant hernias have an increased risk of gastric volvulus causing acute gastric obstruction and strangulation. Controversy exists regarding surgical intervention for asymptomatic giant hiatal hernias. The goals of this study are to determine the incidence of giant hiatal hernias found on CT chest/abdomen, the number of these patients referred for surgical assessment and/or needing emergent surgical intervention.

METHODS: A diagnostic imaging database for the health district was searched from January 2010 to January 2015. Surgical interventions, emergency department encounters and surgical referrals were reviewed using personal health records.

RESULTS: A total of 357,213 CT chest/abdomen reports were searched yielding 388 patients reported to have a diaphragmatic hernia. Hiatal hernias were identified in 185 patients (50.2%). Type III and IV hiatal hernias were reported in 75 patients (38%) including 30 (16.2%) giant hernias. Type IV hernias had the highest percentage of emergency department visits (36.4%). Seven (23.3%) patients with a giant hiatal hernia required emergent repair compare to no patient with a non-giant hernia ($p < 0.001$). However, only 6 (20%) patients with a giant hiatal hernia were referred for surgical assessment.

CONCLUSION: Congenital and type I hiatal hernias compromise the majority of diaphragmatic hernias. Emergency department encounters and need for emergent surgical intervention were highest among Type III and IV hiatal hernias. Patients with giant hiatal hernia are at increased risk for needing emergent surgery. Patients with Type III and IV hernias, and especially those with a giant hiatal hernia, should be referred for surgical assessment because of an increased risk of needing emergent surgical intervention.

SAFETY OF A FAR MEDIAL ARTHROSCOPIC PORTAL FOR ARTHROSCOPIC ANATOMIC GLENOID RECONSTRUCTION: A CADAVERIC STUDY.

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Orthopaedics

BACKGROUND: An arthroscopic technique for Anatomic Glenoid Reconstruction has been proposed for the treatment of bone loss in patients with recurrent shoulder instability. This technique uses distal tibial allograft, which is inserted through a novel portal, superior to the subscapularis tendon and lateral to the conjoined tendon.
PURPOSE: The purpose of this study is to evaluate the safety of the far medial arthroscopic portal for Anatomic Glenoid Reconstruction in a cadaveric study.
METHODOLOGY: Five cadaveric shoulder specimens were dissected after inside-out medial arthroscopic portal insertion in the lateral decubitus position for Arthroscopic Anatomic Glenoid Reconstruction surgery. A single observer performed three measurements on each specimen with a digital calliper (to nearest 0.1mm) from the medial portal to neurovascular structures and the mean and standard deviations were calculated. The anthropometric data of the cadavers were also collected.
RESULTS: The mean distance between the medial arthroscopic portal and sensitive anatomic structures was measured: 61.7mm±4.6mm SD from the lateral cord of the brachial plexus, 62.7mm±8.7mmSD from the musculocutaneous nerve, 46.2mm±12.1mmSD from the axillary nerve, 50.3mm±12.5mmSD from the subclavian artery, 50.3mm±12.5mmSD from the subclavian vein. The mean size of the medial arthroscopic portal was 29mm±2.5mmSD. In all cases the subscapularis muscle was intact. In one case the cephalic vein was injured and in two cases the medial portal was placed medial to it.
CONCLUSIONS: The anteromedial arthroscopic portal for the Anatomic Glenoid Reconstruction without subscapularis split is a safe technique for the anatomic restoration of the glenoid surface in patients with anterior shoulder instability. The closest neurovascular structure is the axillary nerve, which was 46.2mm from the portal tract. The only anatomical structure at risk is the cephalic vein.

NUCLEAR ATYPIA ON FINE NEEDLE ASPIRATE IS NOT ASSOCIATED WITH AN INCREASED RISK OF THYROID CANCER

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Otolaryngology

INTRODUCTION: A diagnosis of *Atypia of unknown significance/ follicular lesion of undetermined significance* (AUS/FLUS) on fine needle aspirates of thyroid nodules carries a malignancy risk of 5-15%. Furthermore, *nuclear atypia* on such FNAs has been associated with an increased risk of malignancy in previous studies. We aimed to investigate the risk of malignancy associated with reported nuclear atypia in patients with AUS/FLUS on FNA.

METHODS: We performed a retrospective chart review of patients with AUS/FLUS on FNA collected between 2013-2015 at our institution. Patients were stratified based on the presence of nuclear atypia or lack thereof on their FNA reports. Post-operative pathology was collected for those who underwent surgery in each group. Chi-square analysis and logistic regression were used to compare the risk of malignancy between the groups.

RESULTS: Nineteen of 37 patients (52%) with AUS/FLUS without nuclear atypia who underwent surgery were found to have cancer on post-operative pathology. In contrast, 18 of 36 patients (50%) with AUS/FLUS and nuclear atypia had cancer (p=1.00). Using logistic regression to control for age and sex, there was no significant association between nuclear atypia and malignancy.

CONCLUSION: Previous studies demonstrate that nuclear atypia on AUS/FLUS FNA reports confers an increased risk of malignancy. In contrast our data demonstrate no difference in malignancy between patients with nuclear atypia and those without. These data warrant further investigation into the role of subcategorization of FNA results.

FREE FLAP BREAST RECONSTRUCTION: NO INCREASED RISK OF BLOOD TRANSFUSION WITH USE OF ANTI-PLATELET AND ANTI-COAGULANT THERAPY.

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Plastic Surgery

BACKGROUND: Free flap transfer surgery is a commonly used method for breast reconstruction, but the use of perioperative anti-platelet and anti-coagulant therapy in these procedures has not garnered much attention. The aim of this study was to further characterize suspected risk factors that predict an increase in perioperative hemoglobin (Hgb) and hematocrit (Ht) deficit, and investigate whether the use of Aspirin and/or low-molecular-weight heparin (LMWH) increases the odds of receiving a blood transfusion in women undergoing free flap breast reconstruction.

METHODS: Data was collected retrospectively on patients who underwent free flap breast reconstruction at a single health center. Pre-operative and post-operative Hgb and Ht were examined and linear regression was used to determine significant relationships between potential risk factors and perioperative deficits. Logistic regression was performed to evaluate whether any significant relationships exist between incidence of perioperative blood transfusions or complications, and older age, obesity, prophylactic low-molecular-weight heparin treatment, Aspirin treatment, operative time, ischemia time, immediate reconstruction, or bilateral reconstruction. Odds were reported as odds ratios (OR).

RESULTS: One hundred twenty two breasts were included from 97 patients. While thirteen patients (13.4%) received a perioperative blood transfusion, there were no risk factors found to increase the odds of receiving one. Patients who had long unilateral surgery (OR=3.44), received a blood transfusion (OR=5.882), or had bilateral surgery (OR=9.283) were at increased odds of experiencing a postoperative complication.

CONCLUSION: Anti-platelet and anti-coagulant therapy did not significantly increase the odds of receiving a perioperative blood transfusion or experiencing a complication.

SHARED DECISION-MAKING DURING SURGICAL CONSULATION: AN OBSERVATIONAL STUDY IN PEDIATRIC OTOLARYNGOLOGY

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Otolaryngology

BACKGROUND: Decisions about elective surgical procedures can be challenging for pediatric patients and their parents. Shared decision-making can help to facilitate this process by involving patients and their parents in the decision-making process. The purpose of our study was to explore how pediatric otolaryngologists involve children and their parents in shared decision-making and which factors are associated with this process.
METHODS: We conducted a prospective observational study involving pediatric patients (>6 years) and their parents undergoing consultation for elective surgical procedures (adeno/tonsillectomy or tympanostomy tube insertion). Consultations were video-recorded and coded using the OPTION instrument to measure the level of shared decision-making. Following interactions, parents completed the Shared Decision-Making questionnaire (SDM-Q-9) and surgeons completed the physician version of the questionnaire (SDM-Q-Doc).
RESULTS: Eighty-seven children and their parents were enrolled. The total mean OPTION score for patients and parents was 3.6 (SD 5.9) and 11.5 (SD 6.4) out of 48, respectively (higher scores indicating higher degree of shared decision-making). The most common OPTION items discussed by surgeons included: “Offers explicit opportunities to ask questions during the decision-making process” and “Explains pros and cons of treatment options”. The least discussed OPTION items were: “Assesses patient’s preferred approach to receiving information to assist decision-making” and “Elicits patient’s preferred level of involvement in decision-making”. SDM-Q-9 and SDM-Q-Doc scores were not correlated to total OPTION scores.
CONCLUSION: Surgeon’s interactions with children and parents mostly involved sharing information as opposed to facilitating shared decision-making. During many encounters, children were not involved in the decision-making process. Parents and physicians perceptions of shared decision-making were not correlated with actual observed behavior. Additional research is needed to provide insight in how to increase surgeon’s assistance towards shared decision-making.

WHY THE P-VALUE ALONE IS NOT ENOUGH: THE NEED FOR CONFIDENCE INTERVALS IN PLASTIC SURGERY RESEARCH

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Plastic Surgery

BACKGROUND: The p-value is one of the most utilized descriptors in statistical analysis; however, when reported in isolation, it does not convey the effect size of a treatment. The reporting of confidence intervals is an essential adjunct to determine the clinical value of treatment, as it permits an assessment of the effect size. We aimed to assess the reporting of confidence intervals in clinical trials within the plastic surgery literature.

METHODS: The seven highest impact plastic surgery journals were screened using MEDLINE for clinical trials in the years 2006, 2009, 2012, and 2015. Studies were randomized based on a predetermined sample size and various characteristics, including the Jadad quality score, reporting of statistical significance, journal impact factor, and participation of a methodologist, were documented.

RESULTS: Two independent reviewers analyzed 135 articles. There was substantial inter-rater agreement (kappa=0.78). Although 86% of the studies reported a p-value, only 26% reported the confidence intervals. The quality of the studies had a median Jadad score of 2 out of 5. Bivariate analysis revealed that a higher Jadad score (p=0.014) and inclusion of a research methodologist were associated with the reporting of confidence intervals. Multivariate analysis revealed similar findings, while journal impact factor, year of publication, and statistical significance were not correlated with confidence interval reporting.

CONCLUSION: Confidence intervals are under-reported in the plastic surgery literature. To improve the reporting quality of clinical trials, results should always include the confidence intervals to avoid misinterpretation of the effect size of a statistically significant result.

A MODIFIED DELPHI STUDY FOR THE DESIGN AND VALIDATION OF KEY TEXT MESSAGES (TONSIL-TEXT-TO-ME) TO IMPROVE PARENT AND CHILD PERIOPERATIVE TONSILLECTOMY EXPERIENCES

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Otolaryngology

BACKGROUND: Tonsillectomy is amongst the most common pediatric procedures, with substantial parental involvement and simultaneous lack of homogeneous resources surrounding perioperative care. Short message service (SMS) technology has become an accessible and direct modality to communicate recommendations and empower parents. This study outlines the development of an SMS protocol Tonsil-Text-To-Me (TTTM) for delivering perioperative education surrounding adeno/tonsillectomy.

METHODS: We conducted a modified Delphi survey study to electronically poll pediatric otolaryngologists, residents and nurses (N=27) to determine which recommendations from seven domains, derived from a previous systematic analysis of online tonsillectomy resources, held a threshold level of consensus: (1) pre-surgical preparation, (2) non-pharmacological pain management, (3) pharmacological pain management, (4) hygiene, (5) diet, (6) activity, and (7) reasons to contact a health care provider. The results created TTTM, subsequently evaluated through multisite interviews using descriptive and thematic analysis.

RESULTS: In the modified Delphi panel, 30 statements reached threshold agreement (>3.0 out of 4.0) and were amalgamated into 12 concise text messages. Of the 30 statements, recommendations surrounding diet and hygiene had the highest level of consensus with 3.87 and 3.83 respectively, while suggestions regarding activity and non-pharmacologic pain management had the least consensus at 3.42 and 3.55 respectively. The resulting SMS protocol spans two weeks preoperatively to one week postoperatively, with an upcoming full-scale implementation study.

CONCLUSION: This study illustrates the development and utility of TTTM to execute content, timing, and sequence of key messages in tonsillectomy perioperative care with a robust SMS communication tool encompassing all identified parental care domains.

COLONOSCOPY COMPETENCY AMONG SENIOR GENERAL SURGERY RESIDENTS

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General Surgery

BACKGROUND: Colonoscopy is a core component of general surgery practice and ensuring that residents receive adequate endoscopy training is essential. Colonoscopy competency is generally defined as achieving a cecal intubation rate (CIR) of 85-90% in patients with intact colons (i.e. no prior colonic resections). The purpose of this research was to determine the proportion of resident colonoscopy procedures that were performed on patients with intact colons, and to compare the CIR between patients with intact colons and those who had a prior segmental colectomy.

METHODS: Colonoscopy performance is prospectively evaluated for all senior general surgery residents during their three-month rotation on the colorectal surgery service. Data are collected regarding number of scopes performed, CIR and patient surgical history. We retrospectively reviewed all scopes performed by residents from April 2016-Feb 2017. The CIR was compared between scopes performed on patients with intact colons and those who had had prior surgery.

RESULTS: During the study period eight residents performed 306 colonoscopy procedures (median 34/ resident, range 18-58). The median CIR for all scopes was 84.5% (range 76-92%). Only 76% of patients had an intact colon. The CIR for colonoscopies performed on patients with an intact colon was significantly lower compared to patients who had had a prior segmental colectomy, median 81% (range 70-94%) vs. 95.5% (range 80-100%) respectively ($p<0.01$).

CONCLUSION: The volume of colonoscopy procedures performed by senior general surgery residents was low and there was considerable variation among trainees. Many residents did not achieve the expected cecal intabation rate in patients with an intact colon. A more rigorous and standardized approach to endoscopy training and competancy assessment is needed.

DELAYED NEW-ONSET HORMONE DYSFUNCTION FOLLOWING COMPLETE AND INCOMPLETE RESECTION OF NONFUNCTIONING PITUITARY ADENOMAS

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Neurosurgery

BACKGROUND: Nonfunctioning pituitary adenomas (NFPA) are commonly occurring, benign tumors of the skull base. Post-operative delayed hormone dysfunction (DHD) is detected by frequent long-term hormonal testing; however, DHD in patients with NFPAs is highly variable and is predicted based on limited evidence. This study was undertaken to assess the likelihood of developing new DHD and its relation to the extent of tumor resection and recurrence.

METHODS: Four hundred fifty-five prospectively collected patient files were reviewed from our Program's database. Inclusion criteria: NFPA; underwent surgery; and minimum follow-up of two years. Tumor recurrence or residual tumor progression was correlated with DHD (starting one year post-operatively) based on standardized annual imaging and hormone testing.

RESULTS: Eighty-nine patients met our inclusion criteria: 39 males and 50 females; mean follow-up was 4.3yrs (ranging from 2 to 11yrs). With no post-op residual tumor, the probability of developing DHD was only 7% by six years; no patient in this group developed DHD after three years of follow-up. In contrast, by six years, the probability of DHD was 33% in patients with residual stable tumor, and 54% in those with tumor recurrence/growth.

CONCLUSIONS: Incomplete resection and tumor progression are associated with an increased likelihood of DHD; these patients require close follow-up of hormonal status. In contrast, our results indicate that the risk of DHD with complete tumor resection is low and that considerable cost savings can safely be achieved in these patients who require less frequent follow-up and hormonal testing.

GROWTH FRIENDLY SURGERY (GFS) VERSUS CASTING FOR THE TREATMENT OF EARLY ONSET SCOLIOSIS (EOS) IN PATIENTS WITH PRADER-WILLI SYNDROME (PWS)

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Orthopaedics

BACKGROUND: PWS patients can present with scoliosis. Non-op/op techniques are both effective treatment modalities; however, no study directly compares casting to GFS. We compared the results of casting to GFS for EOS in PWS patients.

METHODS: PWS patients were identified from two international multi-center EOS databases. Scoliosis, kyphosis, spine height (T1S1), R/L hemithoracic heights/widths (HT H/W) were measured pre-treatment, post-op, and at 2 year f/u. Complications were recorded.

RESULTS: 23 patients with 2 yr f/u were identified. Pre-treatment; casted patients (n=10) were younger (1.8 vs 5.8yr; $p<0.001$), had lower BMI (16 vs 21kg/m²; $p<0.05$), less scoliosis (45° vs 76°; $p<0.01$), similar kyphosis (56° vs 59°), similar T1S1 (22.4 vs 24.1cm), similar RHTH (8 vs 10cm), similar LHTH (8.5 vs 10.6cm), lower RHTW (6.6 vs 9.4cm; $p<0.05$), and similar LHTW (8.0 vs 8.1cm) compared to GFS patients (n=13). At 2 yr f/u (1.9±0.4 vs 2.2±0.2yr), scoliosis improved to 37° Cast ($p=0.06$) and 42° GFS ($p<0.000001$). Scoliosis correction was 13% Cast vs 46% GFS ($p<0.05$). Kyphosis did not change. T1S1 improved to 26.4cm Cast ($p<0.01$) and 31.5cm GFS ($p<0.00001$). RHTH improved to 12cm GFS ($p<0.01$). LHTH improved to 9.98cm Cast ($p<0.01$) and 12.0cm GFS ($p<0.01$). RHTW improved to 7.4cm Cast ($p<0.01$). RHTH correction was 6% Cast vs 31% GFS ($p=0.05$). LHTH, RHTW, and LHTW corrections did not differ. Complications-per-patient were 0.9 Cast vs 2.2 GFS ($p<0.01$). Patients with BMI>17kg/m² had more device-related complications ($p=0.09$). GFS patients ≤5yrs more often had ≥2 complications ($p=0.05$). Patients >7yrs had fewer complications ($p<0.05$).

CONCLUSION: At 2 yr f/u, GFS and casting both effectively treated EOS in PWS. GFS patients improved more in scoliosis, T1S1, and RHTH than casting patients; however, GFS patients had more complications.

NANOPARTICLE-ENCAPSULATED PIPERLONGUMINE MODULATES METASTATIC PROCESSES IN TRIPLE-NEGATIVE BREAST CANCER CELLS

Javad Ghassemi Rad & David W. Hoskin
Pathology

BACKGROUND: Metastatic disease remains the major cause of morbidity and mortality among breast cancer patients. Novel therapeutics are urgently needed to decrease breast cancer mortality by preventing epithelial-to-mesenchymal transition (EMT)-associated metastasis. Piperlongumine, a major alkaloid in pepper spices, inhibits breast cancer cell growth in vivo and in vitro. The purpose of this study was to investigate the anti-metastatic potential of piperlongumine in the context of EMT regulation in triple-negative breast cancer (TNBC) cells, using nanoparticles as drug carriers.
METHODS: The thin-film hydration method was used to encapsulate piperlongumine into biodegradable mPEG-PLGA copolymers. Colorimetric MTT and Annexin-V-FLUOS/propidium iodide staining assays were used to determine the effect of piperlongumine-nanoparticles on growth and viability of TNBC cells. The invasiveness of TNBC cells was tested in the presence of piperlongumine-nanoparticles, using gap closure and micro-chemotaxis assays. TNBC expression of EMT-associated transcription factors were evaluated using western blotting and quantitative real-time PCR.
RESULTS: At cytotoxic doses, piperlongumine-nanoparticles decreased the viability of MDA-MB-231 and MDA-MB-468 TNBC cells to a similar extent as free piperlongumine. Noncytotoxic doses of piperlongumine-nanoparticles inhibited TNBC cell migration and invasion in vitro. Piperlongumine-nanoparticles also decreased expression of EMT markers, β-catenin, Slug, and ZEB1, while increasing the expression of epithelial marker, E-cadherin, in MDA-MB-231 cells. Furthermore, piperlongumine-nanoparticles decreased the expression of histone deacetylases-1 and DNA methyltransferases-1, both of which are known transcriptional suppressors of E-cadherin.
CONCLUSIONS: Piperlongumine inhibits metastatic properties of MDA-MB-231 breast cancer cells through epigenetic changes and inhibition of EMT-associated transcription factors. These findings indicate the potential use of nanoparticles as phytochemical carriers for future in vivo studies to improve the bioavailability and serum solubility of piperlongumine.

THE EFFECT OF STRONTIUM CITRATE ON BONE CONSOLIDATION DURING MANDIBULAR DISTRACTION OSTEOGENESIS IN A RABBIT MODEL

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Otolaryngology

BACKGROUND: Mandibular distraction osteogenesis (MDO) is a well-accepted treatment to alleviate upper airway obstruction in children with micrognathia. It is a surgical procedure that lengthens bone by gradual external distraction, which requires a long consolidation phase. Strontium is an element that has been shown to improve bone healing. The objective of this study was to determine if strontium citrate can be used enhance bone healing during MDO in a rabbit model.

METHODS: Custom made MDO devices were placed on 20 New Zealand white rabbits. After a 7-day latency period, distraction was performed at 1 mm/day for 5 days. The study group rabbits received oral strontium citrate; the other 10 rabbits served as controls. Mandibles were removed at the end of the 4-week consolidation period. Formation of new bone was evaluated with micro-computed tomography, histology, and three-point bending mechanical test.

RESULTS: New bone formed in all rabbits, but the consolidation process was enhanced in rabbits that received strontium. The histological analysis showed that study group rabbits had more mature bone. Micro-computed tomography images demonstrated significantly higher bone density for study group animals, and the three-point bending test results demonstrated that the maximum load of the study group specimens was significantly greater than the control group mandibles.

CONCLUSION: Strontium citrate improved the formation of new bone in the current rabbit model of MDO. The prolonged consolidation period may be shortened with strontium citrate and has the potential to reduce complications.