UBC Department of Surgery's

WB & MH CHUNG LECTURESHIP AND RESEARCH DAY

NOVEMBER 1, 2021

Zoom
ID: 96854 415353
Passcode: 415353

or

In person
Paetzold Auditorium
Vancouver General Hospital

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Message from the Department Head, Dr. Gary Redekop

I am very pleased to welcome all of our faculty, staff, and trainees to the 2021 edition of our Department of Surgery Research Day and Chung Lectureship. We are still impacted by the Covid-19 pandemic, and will conduct the day in a hybrid "in-person" and virtual format, which will allow for attendance and participation from all of our distributed sites.

Our Chung Professor is Dr. Gelareh Zadeh, a pioneering neurosurgeon-scientist, and the first woman to Chair a Division of Neurosurgery in Canada. She is a Professor in the Department of Surgery at the University of Toronto, where she holds the Dan Family Chair. As we acknowledge with thanks the support and contribution of the benefactors of this prestigious lectureship, Drs. Wally and Madeline Chung, our thoughts and prayers are with Wally and the Chung family, as they mourn the passing of Madeline in August.

Chung Day highlights the wide range of basic, clinical, and translational research in our department, and also provides an opportunity to recognize excellence in scholarship among our faculty. This year, the H W Johnson Young Investigator Award goes to Dr. Andrew Thamboo, and the Richard Finley Senior Scholar Award goes to Dr. Chris Honey.

I would like to thank all of our faculty, staff, and trainees for their perseverance and contributions to surgical science and scholarship during the past year. As we look to the future, with a focus on further enhancing research in the Department of Surgery, I would like to congratulate Dr. Robert Olson on his appointment as the Associate Head, Research. His portfolio of responsibilities includes fostering an effective, inclusive and supportive research environment, supporting department members to become nationally and internationally recognized leaders in basic, clinical, and translational research. We will build on established research excellence by promoting cross-cutting research themes and opportunities for collaboration as well as increase capacity for innovative research by supporting faculty to access core research platforms and launching departmental seed grants.

Gary Redekop
Head, Department of Surgery
November 2021

Founders of the W.B and M.H. Chung Lectureship

Prior to the establishment of the W.B. and M.H. Chung Research Day, the Department of Surgery only had Division specific research days. In 1995, the Dr. W.B. and M.H. Chung created an endowment that allows us to hold an annual research day that has become the premier, department-wide event at which we recognize our research achievements.

Wallace B. Chung, MDCM, FRCSC, DSc '94

Dr. Chung was born and raised in Victoria, British Columbia. After pre-medical education at Victoria College and UBC, he attended the McGill University and received his M.D. in 1953. Following internship and surgical residency training at VGH and UBC, Dr. Chung was appointed to the Department of Surgery at UBC as an Instructor in 1960. After being appointed to an Assistant Professor in 1961, Dr. Chung rose quickly through the ranks to become a full Professor in 1972. For his many professional and community contributions, Dr. Chung has received many awards, including being appointed to the Order of Canada in 2005.

Professional Career

Dr. Chung was noted as a technically gifted surgeon who pioneered Vascular Surgery in Western Canada. In particular, Dr. Chung was known for his excellent surgical results for carotid artery surgery for transient ischemic attacks. He established Vascular Surgery as a new specialty in BC, and as a separate division of surgery at VGH and UBC. He was one of founders of the Canadian Society for Vascular Surgery, and served as its president in 1982. Throughout his academic career, Dr. Chung has taken positions of responsibility (appointed University Head of the Division of General Surgery in 1970, Head of the University Division of General and Vascular Surgery in 1978, Head of the Department of Surgery at the University Hospital in 1981). During his nine year tenure he built the University Hospital Department of Surgery into an excellent academic unit with international recognition for vascular surgery and gastrointestinal surgery. He was also the Governor of the American College of Surgeons from 1980 to 1986. Dr. Chung has received many awards for his teaching and service, including being honoured by the vascular surgeons of British Columbia with a named day – The Wallace B. Chung Clinical Day.

Community Service

Dr. Chung has also been an effective and tireless pillar of the community. He has used his extraordinary gifts of wisdom and diplomacy to help advance the integration of the Chinese Community. He was one of the founding executives of the Chinese Cultural Centre of Vancouver serving as Chair from 1983-87. Under Dr. Chung's leadership, the Centre has become a model for other multicultural programs in Canada. Among his other community activities, Dr. Chung is a founding member and patron of the Sun Yat-Sen Gardens, served on the Board of Directors International Dragon Boat Festival Society, and Vice Chair of the Canadian Multiculturalism Council. Dr. Chung's contributions have been recognized by awards (Chinese Cultural Centre Outstanding Achievement Award in 1989 and Chinese Benevolent Association Outstanding Citizen Award in 1990) and his appointment to the B.C. Heritage Trust in 1993.

History Scholar

An avid reader and collector of first edition rare books, Dr. Chung became a renowned authority and collector of one of Canada's best libraries on the history of the Pacific Northwest exploration and Chinese Canadian immigration. Due to his interest in the Canadian Pacific Steamship Company, Dr. Chung was a guest curator of the Vancouver Maritime Museum for the "Empress to the Orient Exhibition" in 1991. In recognition of this interest, the Vancouver Maritime Museum has named its library, the W.B. and M.H. Chung Library. In 1999 he made a gift of more than 25,000 rare and unique items to the University of British Columbia. The Chung Collection is housed in the Ike Barber Learning Centre (http://chung.library.ubc.ca/) and attracts scholars and visitors from around the world.

Madeline Chung, MD, FRCSC

Dr. Madeline Chung was born in Shanghai, China. Her medical education took place at the Yale Medical College of China. She did her internship in Victoria, B.C. followed by specialty training in Obstetrics and Gynecology in Montreal and at the Mayo Clinic in Rochester, Minnesota. Upon coming to Vancouver in the late 1950's, she was the first female and first Chinese-Canadian specialist in Obstetrics and Gynecology in British Columbia. She was appointed as a Clinical Instructor at the University of British Columbia and by the time of her retirement she had delivered over 6,500 babies over a 40 year career, and held the rank of Clinical Professor. Shortly after her retirement from clinical practice she was made an Honorary Life Member of the College of Physicians & Surgeons of British Columbia. Dr. Madeline Chung was also a Clinical Professor Emeritus of the Department of Obstetrics and Gynecology in the Faculty of Medicine at the University of British Columbia. She passed away on August 22, 2021.

Physician

She was known as a compassionate and empathic physician who gave freely and willingly of her time to her patients, often acting as a counselor to her patients and mentor to the children and adults who she had previously delivered. Frequently, the children she delivered would return to see Madeline years later when it was time for them to have their own babies.

Community Service

Dr. Madeline Chung extended her philosophy of volunteerism and service to the community in all aspects of her life. Not only was this evident in her professional life but she was active in her church and community as well. She served on boards of the Chinese United Church, the Vancouver Academy of Music, and was the founding Executive Director of the True Light Chinese School in Vancouver. Well into her eighties, she was given an honorary graduation certificate from York House School in recognition of her contributions to the school.

Family

Despite her tireless devotion and dedication to her patients she was still able to balance a healthy family life providing endless support to her husband, Wally, while raising two children who felt inspired enough by their home life to pursue careers in medicine. Their daughter Dr. Maria Chung is in the Division of Geriatric Medicine at the University of British Columbia. Their son Dr. Stephen Chung is the past University of British Columbia Head of the Division of General Surgery and the current Vancouver General Hospital Head of Hepatobiliary & Pancreatic Surgery. Late in her career, she experienced a life-threatening illness but was able to return to full-time work. At the same time, she was the primary caregiver to her elderly mother whom she looked after in her home.

Learning Objectives

The University of British Columbia Division of Continuing Professional Development (UBC CPD) is fully accredited by the Committee on Accreditation of Continuing Medical Education (CACME) to provide study credits for continuing medical education for physicians. This event is an Accredited Group Learning Activity (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada, and has been approved by UBC CPD for up to 5.75 MOC Section 1 Group Learning credits. Each physician should claim only those credits accrued through participation in the activity.

1. To describe and evaluate the clinical, education and basic science research being conducted in the Department of Surgery.
2. To discover new and innovative research techniques.
3. To participate in the collaborative research environment within the Department of Surgery.

Research Day Schedule

Plenary Sessions

*8 minute paper with 2 minute discussion

Paetzold Lecture Theatre, VGH with Zoom Connections

8:00	**Dr. Gary Redekop** ***Department Head's Welcome***
8:15	**Chung Lecturer: Dr. Gelareh Zadeh,** ***Professor and Dan Chair, Neurosurgery, University of Toronto***

9:15	**Rokui, Sorush**		***Cardiac Surgery***
		P1	Preliminary Insights in Sternotomy vs. Minimally Invasive Approaches for Implantation of Left Ventricular Assist Devices
9:25	**Mysuria, Shivani**		***General Surgery***
		P2	Oncoplastic Breast Reduction Complications and Patient-Reported Outcomes
9:35	**Honey, Chris**		***Neurosurgery***
		P3	Thalamic Deep Brain Stimulation for Spasmodic Dysphonia: A Phase I Prospective Randomized Double-Blind Crossover Trial
9:45	**Milner, Thomas**		***Otolaryngology***
		P4	Predicting extranodal extension in early-stage human papilloma virus-driven oropharyngeal cancer: machine learning using PET CT and clinical parameters
9:55	**Bell Peters, Petra Francesca**		***Pediatric Surgery***
		P5	The Importance of the Ileocecal Valve and Colon in Achieving Intestinal Independence in Infants with Short Bowel Syndrome
10:05	**Smyth, Matthew**		***Pediatric Surgery***
		P6	Biliary Atresia in British Columbia: an 18 year review of intervention and outcomes.
10:15	**Mankowski, Peter**		***Plastic Surgery***
		P7	Implementing provincial major burn resuscitation guidelines for reducing patient mortality.
10:25	**Urban, Ryan**		***Radiation Oncology***
		P8	Cervical Cancer Patient Reported Gastrointestinal Outcomes: Intensity/Volumetric Modulated vs. 3D Conformal Radiation Therapy
10:35	**Sit, Daegan**		***Radiation Oncology***
		P9	A retrospective study of patients with low-risk, node-positive breast cancer: anticipating the results of the TAILOR RT randomized trial of regional nodal irradiation
10:45			BREAK
11:00	**Skarsgard, Peter**		***Cardiac Surgery***
		P10	Development of a Non-invasive Medical Device Therapy for All Expressions of Degenerative Mitral Regurgitation: Papillary anchor feasibility, durability, biocompatibility, and delivery.
11:10	**Afford, Rebecca**		***General Surgery***
		P11	Improving surgical quality for patients with mental illnesses: a narrative review
11:20	**Merali, Khalil**		***General Surgery***
		P12	The Relationship Between Perceptions of Shared Decision-Making and Patient-Reported Outcomes in a Cross-Sectional Cohort of Hemorrhoidectomy Patients
11:30	**Lalande, Annie**		***General Surgery***
		P13	Determining the current state of patient satisfaction, nutrition, and environmental impact with the inpatient menu at Vancouver General Hospital

11:40	**McGuire, Anna**		***Thoracic Surgery***
		P14	Circulating tumour DNA to detect lung cancer recurrence following surgery: a preliminary report
11:50	**Heffernan, Austin**		***Otolaryngology***
		P15	Virtual and Augmented Reality in the Vestibular Rehabilitation of Peripheral Vestibular Disorders: Systematic Review and Meta-Analysis
12:00	**Cherukupalli, Abhiram**		***Otolaryngology***
		P16	Evaluating the benefit of virtual surgical planning on operative time and patient outcomes in head and neck reconstructive surgery
12:10	**Parvand, Mahraz**		***Otolaryngology***
		P17	Surgical coaching: Patient perspectives regarding physician coaches in the operating room
12:20	**Zhang, Zach**		***Plastic Surgery***
		P18	Medico-legal Closed Case Trends in Canadian Plastic Surgery: A Retrospective Descriptive Study
12:30	**Olson, Robert A**		***Radiation Oncology***
		P19	Population-based phase II trial of Stereotactic Ablative Radiotherapy (SABR) for up to 5 Oligometastases: Primary Toxicity Results of the SABR-5 Trial
12:40			LUNCH
13:10	**Percy, Edward**		***Cardiac Surgery***
		P20	Repeat Transcatheter Aortic Valve Replacement: Insights from the United States Medicare Database
13:20	**Farooq, Ameer**		***General Surgery***
		P21	Do rectal cancer patients “regret nothing”? Decisional regret after organ-preservation therapy in rectal cancer
13:30	**Hilzenrat, Roy**		***Thoracic Surgery***
		P22	Lung transplantion for COVID-19 induced pulmonary fibrosis: the first Canadian series
13:40	**Chang, Stephano**		***Neurosurgery***
		P23	MR Tractography-Based Targeting and Physiological Identification of the Cuneiform Nucleus for Directional DBS in a Parkinson’s Disease Patient with Levodopa-Resistant Freezing of Gait
13:50	**Deane, Emily Catherine**		***Otolaryngology***
		P24	Two-Team vs. Single Surgeon Free Flap Reconstruction of the Head & Neck: A Case for Teamwork & Potential Cost-Savings
14:00	**Roller, Janine**		***Plastic Surgery***
		P25	Clinical Decision Analysis for Post-Mastectomy Alloplastic Breast Reconstruction in the setting of Radiation Therapy: A Markov Model
14:10	**Kong, Timothy**		***Radiation Oncology***
		P26	Population-based Analysis of Outcomes for Patients wiht Brain Metastases from Epidermal Growth Factor Receptor Mutation Position Non-Small Cell Lung Cancer Treated with Tyrosine Kinases Inhibitor Alone or Combined with Radiotherapy
14:20	**Choi, Sally**		***Vascular Surgery***
		P27	Evaluation of Factors Associated with Limb Thrombus Formation Post-Endovascular Aortic Aneurysm Repair

Resident Competition

Plenary Session Abstracts

P1 – 9:15

Title: Preliminary Insights in Sternotomy vs. Minimally Invasive Approaches for Implantation of Left Ventricular Assist Devices
Authors: Sorush Rokui, Laura Besola, Jamil Bashir, Anson Cheung
Affiliations: Division of Cardiac Surgery
Background: Left ventricular assist devices (LVAD) are the preferred method of mechanically assisted circulatory support (MCS). Indications include substantial heart failure symptoms despite optimal medical therapy, inotrope dependence, and end-organ dysfunction due to low cardiac output. LVADs are traditionally implanted via median sternotomy; however, minimally invasive access, through bilateral thoracotomy or mini-sternotomy plus left anterior thoracotomy, has been described and may offer benefits such as shorter length of hospital stay and lower inotropic requirement. Notably, it has been purported that minimally invasive implantation may lead to less right ventricular failure and requirement for right ventricular assist devices (RVAD).
Objective: To assess a cohort of recent LVAD recipients in British Columbia to understand trends and outcomes in sternotomy versus minimally invasive access.
Methods: 34 patients (2018-2021) were reviewed. Demographic data, previous cardiac and non-cardiac medical history, symptom burden (CCS and NYHA classifications), indication for LVAD, pre-operative mechanically assisted circulatory support, pre-operative echocardiographic metrics, and outcomes (including disposition and candidacy for transplant) were collected and compared between those receiving LVAD implantation via median sternotomy versus minimally invasive access.
Conclusions: Pre-operative data comparison between median sternotomy and minimally invasive groups reveals no significant difference in demographics, BSA, operative urgency, pre-operative inotropic requirement, symptom burden, left ventricular ejection fraction, pulmonary artery systolic pressure, left ventricular end diastolic diameter, or type of VAD in the decision of median sternotomy or minimally invasive access. Rates of transplant post-LVAD, death, and ongoing care are similar between groups. Right ventricular function after LVAD implantation remains to be formally assessed between groups, though preliminary trends suggest roughly equivalent measures of right ventricular function between approaches.

P2 – 9:25

Title: Time to First Adjuvant Treatment After Oncoplastic Breast Reduction
Authors: Shivani Mysuria, Mabel Zhang, Elaine McKevitt, Rebecca Warburton, Amy Bazzarelli, Jin-Si Pao, Leo Chen, Urve Kuusk, Nancy Van Laeken, Esta Bovill, Kathryn Isaac, Carol Dingee
Affiliations: Department of Surgery, University of British Columbia. Department of Surgery, Providence Breast Centre.
Background: Oncoplastic Breast Reduction (OBR) allows breast conservation surgery (BCS) to be combined with breast reduction for select breast cancer patients. Adjuvant therapies are often a recommended part of the management plan, but whether OBR complications delay these treatments has been questioned.
Objective: The objective of this study was to measure time to first adjuvant treatment (AT) in OBR patients, and whether initiation dates conformed to conventional post-BCS treatment windows for radiation (RT), chemotherapy and endocrine management. **Methods:** Institutional and university ethics boards approved this retrospective review, which included all patients receiving OBR from April 2009 to April 2020. Consecutive patients were identified from operative slates. Data was extracted from a prospectively maintained database and surgeons' electronic medical records. Relative start date (RST) of AT was calculated as time elapsed between the OBR date and earliest start date or the first day post-resolution of delays due to medical reasons or patient preference.
Conclusions: This study included 5504 new breast cancer cases, and 81 had OBR. OBR patients had unilateral (N=79) or bilateral (N=1) breast cancer, malignant phyllodes tumor (N=1), had bilateral (N=73) or unilateral (N=8) OBR, and had OBR as a first surgery (N=69) or during margin re-excision post-BCS (N=12). Additional surgery post-OBR was required by 7 patients for margin revision (N=6) or sentinel node biopsy (N=1), while 7 had completion mastectomy. No patients required reoperation for debridement, or hematoma evacuation. In total, 72 (88.9%) patients received AT— 36 started with radiation, 19 with chemotherapy, and 17 with endocrine. RST averaged 9.4 weeks for radiation, 7.0 weeks for chemotherapy, 8.0 weeks for endocrine, and 8.4 weeks for any AT. Among patients receiving AT, 70 (97.2%) initiated AT by week 16, and 100% of patients that received chemotherapy first initiated AT by week 12. Average time to first adjuvant treatment conformed to local recommendations for chemotherapy 8 upper limit 12 weeks, radiation 10 upper limit 20 weeks, and endocrine therapy with the greatest variation in local recommendations.

P3 – 9:35

Title: Thalamic Deep Brain Stimulation for Spasmodic Dysphonia: A Phase I Prospective Randomized Double-Blind Crossover Trial
Authors: Chris Honey[1], Linda Rammage[2], Mandeep Tamber[1], Murray Morrison[3], Amanda Hu[3]
Affiliations: [1]Division of Neurosurgery, [2]School of Audiology and Speech Science, [3]Division of Otolaryngology.
Background: Adductor spasmodic dysphonia (SD) is a dystonia of the vocal folds causing difficulty with speech. The current standard of care is repeated botulinum toxin injections to weaken the adductor muscles. We sought to ameliorate the underlying neurological cause of SD with a novel therapy—deep brain stimulation (DBS).
Objective: To assess the safety of DBS in SD through phase I trial, and to quantify the magnitude of any benefit.
Methods: Six patients with adductor SD had left ventral intermediate nucleus (Vim) thalamic DBS and were randomized to 3 months blinded-DBS "on" or "off" followed by a crossover. Primary outcomes were quality of life (subjectively measured using Voice Related Quality of Life questionnaire validated for SD) and quality of voice (objectively measured using Unified SD Rating Scale validated for SD) during the blinded phase. Patients then continued with another 6 months of open-DBS "on." Secondary outcomes were comparisons of pre-operative and 1-yr post-operative cognitive (MoCA), mood (Beck Depression Inventory), and quality of life (V-RQOL). This trial was registered with ClinicalTrials.gov (NCT02558634) prior to recruitment.
Conclusions: There were no complications. Every patient reported an improvement in quality of life (P=.07) and had an improvement in quality of their voice (P=.06) when their blinded DBS was "on" versus "off." The trend did not reach statistical significance with the small sample size. The median effect size for quality of life (on a scale 0-100, higher better) was 55.7 (95% CI 33.5, 63.5) which was

enough to improve the cohort's median score by 2 categories from "poor" to "good". The median effect size for the quality of voice (on a scale 0-7, lower better) was -1.25 (95% CI -0.75, -1.75). Secondary outcomes showed no difference in cognition, an improvement in mood, and quality of life at 1 yr. This phase I randomized controlled trial confirmed that DBS can be performed safely in patients with SD. Blinded DBS produced a strong trend toward improved quality of life and objective quality of voice despite the small sample size. The magnitude of improvement allows for a power calculation for a Phase II trial. The cerebellar circuit, not the pallidal circuit, appears to be crucial for motor control of the vocal fold.

P4 – 9:45

Title: Predicting extranodal extension in early-stage human papilloma virus-driven oropharyngeal cancer: machine learning using PET CT and clinical parameters.

Authors: Milner TD[1], Wilson D[2], Martineau P[2], Bloise I[2], Uribe C[2], Wang, E[1], Dinur A[1], Prisman E[1]
Affiliations:
1)Department of Otolaryngology, Vancouver General Hospital
3) Department of Nuclear Medicine, Vancouver General Hospital

Background: Early-stage human papilloma virus (HPV)-driven oropharyngeal cancer has excellent survival outcomes. The current therapeutic strategies aim to reduce treatment-related morbidity: transoral robotic surgery (TORS) +/- adjuvant (chemo)radiotherapy, or upfront (chemo)radiotherapy
+/- salvage surgery. Greatest morbidity is associated with tri-modality therapy, and identification of patients with aggressive disease is essential. Extranodal extension (ENE) is one of the primary indications for adjuvant chemoradiotherapy. Pre-treatment identification of ENE, would allow patients to be directed to primary oncological management.
Objective: To identify PET CT and clinical parameters that predict ENE in early-stage HPV-driven oropharyngeal cancer.
Methods: Retrospective collation of clinical, radiological and pathological data in all patients with early-stage HPV-driven oropharyngeal cancer (cT1-3N0-2) undergoing TORS between January 2016 and September 2021. Pre-operative PET CTs were re-evaluated to establish standard uptake value (SUVmax), metabolic tumour volume, total lesion glycolysis, and uptake patterns in primary and nodal disease. Risk of ENE was evaluated with respect to clinical and PET CT parameters.
Results: Of the 75 patients fitting inclusion criteria, pathological nodal disease (n=59) and ENE (n=16) were determined. Multivariate analysis indicates increasing age (p=0.046), combined tongue base and tonsil tumours (p=0.023), indistinct nodal margins (p=0.022) and higher nodal SUVmax (p=0.030) are all associated with increased risk of ENE. A high volume of variance was accounted for by the model, with an AUC of 0.89.
Conclusions: This study indicates that clinical and PET CT parameters are able to predict the presence of ENE, having implications for optimising patient outcomes.

P5 – 9:55

Title: The Importance of the Ileocecal Valve and Colon in Achieving Intestinal Independence in Infants with Short Bowel Syndrome

Authors: Francesca Bell Peters, BSc[a], Jeffrey N Bone, MSc[b], Rhonda Van Oerle, BSc, RD, CNSC[c], Susan Albersheim, MD, PhD[c], Linda Casey, MD[d], Hannah Piper, MD[e]
Affiliations:
[a]*Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada*
[b]*BC Children's Hospital Research Institute, Vancouver, BC, Canada*
[c]*Division of Neonatology, University of British Columbia/BC Women's Hospital and Health Center, Vancouver, BC, Canada*
[d]*Department of Pediatrics, University of British Columbia/BC Children's Hospital, Vancouver, BC, Canada*
[e]*Division of Pediatric Surgery, University of British Columbia/BC Children's Hospital, Vancouver, BC*

Background: Infants with short bowel syndrome (SBS) wean from parenteral nutrition (PN) support at variable rates. Small bowel length is a predictor, but the importance of the ileocecal valve (ICV) and colon are unclear.
Objective: We aim to determine if the ICV and/or colon predict enteral autonomy.
Methods: Infants from a single intestinal rehabilitation program were retrospectively reviewed. Etiology of SBS, intestinal anatomy, and duration of nutritional support were collected for three years. The primary outcome was time to full enteral nutrition. ANCOVA and Cox proportional hazards model were used, with $p<0.05$ significant.
Results: 55 infants with SBS were included. After accounting for the effect of small bowel, PN duration was shorter for infants with the ICV compared to those without (mean 218 vs. 538 days, p=0.003), and had a more significant effect on infants with ≤50% of small bowel. Increased small bowel length was a positive predictor of weaning. Patients with ≤50% of colon spent less time on PN with the ICV, compared to without (mean 220 vs 715 days, p=0.009).
Conclusions: Preservation of the ICV was associated with shorter duration of PN support, while colon was not. Small bowel length is a positive predictor of enteral autonomy.

P6 – 10:05

Title: Biliary Atresia in British Columbia: an 18 year review of intervention and outcomes.
Authors: Matthew Smyth, Robert Baird, Richard Schreiber
Affiliations: [1]University of British Columbia, Faculty of Medicine. [2]Department of Pediatrics, Division of Gastroenterology, Hepatology, and Nutrition [3]Department of Surgery, Division of Pediatric Surgery
Introduction: Biliary Atresia (BA) is a rare and life-threatening cause of common bile duct obstruction in newborns. It is characterized by progressive fibroinflammatory changes that result in obstruction of the biliary tree, with a variable presentation that may include jaundice, acholic stools, and hepatomegaly. It is often insidious in onset and typically presents within the first few weeks to months of life, and leads to liver failure and death without intervention. Diagnosis includes U/S, HIDA scan, liver biopsy and cholangiogram. Surgical intervention with a Kasai portoenterostomy can relieve the obstruction and provide biliary drainage, and the earlier in life it is performed the more likely to be successful it is. Despite the adoption of early Kasai, biliary atresia continues to be the leading cause of liver transplant in the pediatric population. Early identification of biliary atresia and surgical intervention have been associated with better outcomes.
Objective: To review Biliary Atresia in British Columbia since 2000 and evaluate the age at presentation, delay in diagnosis and Kasai procedure, as well as to evaluate outcomes including the need for transplant and survival rate.
Methods: A retrospective review was conducted of all patients referred to British Columbia Children's Hospital (BCCH) between January 1st 2000 and December 31st, 2018 with confirmed Biliary Atresia. The review included age at initial contact with BCCH and age at Kasai procedure. Outcomes included the need for liver transplant (with or without Kasai, early or late Kasai failure)
Results: Forty eight patients in British Columbia were diagnosed with Biliary Atresia over the study period, an average incidence of approximately 1:17,000 live births. Twenty eight (58%) were female. Patients were referred primarily from Fraser Health (37.5%) and Vancouver Coastal (32%). Forty one (85%) underwent Kasai, 7 (15%) underwent primary liver transplantation. Of those who had a Kasai procedure, 23 (56%) went on to transplant, for a total of 30 (63%) patients receiving transplantation. Twenty one (51%) of those with a Kasai had early failure, defined as requiring transplant within 3 years of Kasai.
Median (IQR) age at first encounter with BCCH was 52 days (23-87) and age at Kasai procedure was 62 (48-87). The median delay from the time of first encounter to the Kasai procedure was 10 days (4.5-21). For those infants that went on to receive a transplant, the median time from Kasai to transplant was 7.0 months (5.0-11.7 months). Median age at transplant was 9.6 months (8.0-13.5 months). Median age at presentation for patients who ultimately received a transplant was 61.5 days, compared to 41.5 days in those who did not require transplant (p=0.2 NS). The 41 Kasai procedures were completed by 7 different pediatric surgeons, each of whom completed between 1 and 10 procedures within the study period.
At last follow-up, 1 patient was lost to follow-up, 3 patients had died (6%), and 44 (92%) were still alive.
Conclusions: This review of Biliary Atresia in British Columbia demonstrates a delay in initial presentation and Kasai procedure, with a majority of patients requiring liver transplantation within the first few years of life. Further evaluation is required to identify potential improvements in diagnosis and early surgical intervention for these patients in this province.

P7 – 10:15

Implementing provincial major burn resuscitation guidelines for reducing patient mortality.
Peter Mankowski[1], MD, MSc, Bettina Papp[1], Anthony Papp[1], MD PhD FRCSC
Affiliations: [1]Division of Plastic Surgery, Department of Surgery, University of British Columbia
Background:
Fluid resuscitation is a major element of modern burn care that aims to mitigate the effects of acute burn shock. In the province of British Columbia, Canada recommendations for optimal fluid resuscitation were publish in the 2011 to improve the management of acute burn patients prior to transfer to a specialized burn center.
Objective: The goal of this study was to determine peripheral center compliance with the provincial burn resuscitation guidelines and their subsequent impact on patient mortality.
Methods: A retrospective review of patients transferred to the BC provincial burn center after initially being managed at peripheral sites was performed from 2011 – 2019. Patients were included if their burn injury was greater than 20% TBSA to warrant resuscitation and were transferred during the first 48 hours after resuscitation. Charts were review for evidence of guideline compliance at both treatment centers. The total amount of fluid patients received during resuscitation was tabulated in addition to resuscitation associated outcomes including volume status, respiratory failure and death.
Conclusions: A total of 72 patients met the inclusion criteria, 37 of which were treated in accordance to the 2011 guidelines. For patients that followed the 2011 provincial guidelines, they received on average 3.2 cc/kg/TBSA during the first 24 hours post burn injury. For patients that do not follow the 2011 guidelines they received on average 4.4 cc/kg/TBSA of fluid. This reduction confirming that the 2011 BC provincial burn management guidelines significantly limited excess fluid administration during acute resuscitation (p-value=0.03). Additionally, when more stringent resuscitation was followed, mortality rates were also significantly lower during their primary admission (16.2% vs 2.7%, p-value = 0.04). No significant differences were found between the remaining assessed complications including abdominal compartment syndrome (8.1% vs 2.7%), respiratory failure (16.2% vs 5.4%), need for **escharotomy (35.2% vs 21.6%) and need for tracheostomy (46.0% vs 29.7%).**

P8 – 10:25

Title: Cervical Cancer Patient Reported Gastrointestinal Outcomes: Intensity/Volumetric Modulated vs. 3D Conformal Radiation Therapy
Authors: Ryan Urban MD[1,2], Justin Wong BSc[1], Peter Lim MD[1,2], Susan Zhang PhD[1,3], Ingrid Spadinger PhD[1,3], Robert Olson MD MSc[1,4], Francois Bachand MD[1,5], Clement Ho MD[1,6], Anna V. Tinker MD[1,7], Lovedeep Gondara MSc[8], Sarah Nicole Hamilton MD[1,2]
Affiliations: [1]The University of British Columbia, Vancouver, British Columbia, Canada 2Department of Radiation Oncology, BC Cancer - Vancouver, Vancouver, British Columbia, Canada 3Department of Medical Physics, BC Cancer - Vancouver, Vancouver, British Columbia, Canada 4Department of Radiation Oncology, BC Cancer – Prince George, Prince George, British Columbia, Canada 5Department of Radiation Oncology, BC Cancer - Kelowna, Kelowna, British Columbia, Canada 6Department of Radiation Oncology, BC Cancer – Surrey, Surrey, British

Columbia, Canada 7Department of Medical Oncology, BC Cancer - Vancouver, Vancouver, British Columbia, Canada 8Department of Population Oncology, BC Cancer - Vancouver, Vancouver, British Columbia, Canada

Background: Modern radiotherapy (RT) techniques such as intensity modulated RT/volumetric modulated arc therapy (IMRT/VMAT) allow more conformal radiation delivery to the target compared to 3D conformal RT (3DCRT). There is a lack of data regarding the impact of IMRT/VMAT techniques on patient reported gastrointestinal (GI) outcomes in the definitive RT setting for cervix cancer. The ability of IMRT/VMAT to spare GI structures may reduce the risk of GI toxicity during treatment.

Objective: To evaluate gastrointestinal (GI) patient reported outcomes (PROs) in cervical cancer patients treated with definitive radiotherapy (RT), comparing 3D conformal RT (3DCRT) vs. intensity modulated/volumetric modulated arc therapy (IMRT/VMAT).

Methods: A retrospective analysis of patients treated with definitive RT between 2015-2018 was performed. GI PROs were collected at baseline, during RT (acute), ≤12 weeks after RT (subacute), and
>12 weeks after RT (late). GI PROs evaluated three symptom domains: bowel problems (BP), bowel bother (BB), and abdominal problems (AP).

Results: The cohort included 167 patients. 100 (60%) patients were treated with IMRT/VMAT and 67 (40%) with 3DCRT.
In the subacute phase, the mean change of symptom scores from baseline in 3DCRT vs. IMRT/VMAT were +0.9 vs. -1.15 (p=0.01) for BP, +2.18 vs. -0.10 (p=0.02) for BB, and +1.41 vs. -0.38 (p=0.01) for AP.
Likewise, in the late phase, mean changes were +0.72 vs. -0.82 (p=0.01) for BP, +1.98 vs. -0.03 (p=0.01) for BB, and +1.29 vs. -0.31 (p=0.01) for AP.
On multiple linear regression analysis, 3DCRT was associated with greater mean changes in subacute and late symptom scores in BP (subacute 0.29 (0.08-0.51), p=0.01; late 0.22 (0.03-0.41), p=0.02), BB (subacute 0.32 (0.04-0.61), p=0.03; late 0.26 (0.03-0.49), p=0.03), and AP (subacute 0.27 (0.05-0.48),
p=0.01; late 0.24 (0.08-0.40), p=0.01) compared to IMRT/VMAT.

Conclusions: 3DCRT was associated with significantly greater worsening of GI PRO symptom scores relative to IMRT/VMAT in all three GI domains ≤12 weeks and >12 weeks after RT. These data support the ongoing use of IMRT/VMAT in routine practice.

P9 – 10:35

Title: A retrospective study of patients with low-risk, node-positive breast cancer: anticipating the results of the TAILOR RT randomized trial of regional nodal irradiation

Sit, Daegan (1); Lalani, Nafisha (1); Chan, Elisa (1); Tran, Eric (1); Speers, Caroline (2); Gondara, Lovedeep (3); Chia, Stephen (3)

Purpose/Objective(s): The benefit of regional nodal irradiation (RNI) in women with low-risk, node- positive breast cancer is uncertain. TAILOR RT enrols breast cancer patients with 1-3 involved macroscopic nodes and a low risk Oncotype DX Recurrence Score (<18) to determine breast cancer recurrence-free interval (BCRFI) with and without RNI. We report BCRFI in a retrospective study of patients similar to those enrolling in TAILOR RT.

Materials/Methods: Patients aged 40-79 with pT1-2 pN1 (macroscopically node-positive) breast cancers were identified in a population-based database between 2005 and 2014. Eligible patients had BCS (breast- conserving surgery) or mastectomy & axillary lymph node dissection (ALND) with 1-3 positive nodes, BCS & sentinel lymph node biopsy (SLNB) with 1-2 positive nodes or mastectomy & SLNB with 1 positive node. Eligible patients had: estrogen receptor positive (Allred 6-8/8), progesterone receptor positive (Allred 6-8/8), human epidermal growth factor receptor 2 (HER2)-negative, and grade 1-2 breast cancers. All patients were prescribed hormonal treatment. The primary endpoint of BCRFI, which was the time to any breast cancer recurrence or breast cancer-related death, was analyzed using multivariate competing risks analysis.

Results: The cohort included 1,169 women with a median follow-up of 9.2 years. Radiation treatments were: none (151 treated with mastectomy alone), breast only (133) and locoregional (885). Patients undergoing RNI had significantly younger age (median 58 versus 62 years), were more likely to have 2-3 macroscopic lymph nodes involved and received chemotherapy more often (all p<0.05). The 10-year estimate of BCRFI was 90% without RNI versus 90% with RNI (p=0.5). On multivariable analysis, RNI was not a significant predictor of BCRFI (HR=1.0, p=0.9).

Conclusion: For women with low-risk by standard pathological assessment, node-positive breast cancer, RNI was not associated with better outcome, which supports the non-inferiority design of TAILOR RT and ongoing enrolment to the trial.

P10 – 11:00

Title: Development of a Non-invasive Medical Device Therapy for All Expressions of Degenerative Mitral Regurgitation: Papillary anchor feasibility, durability, biocompatibility, and delivery.

Authors: Peter Skarsgard[1], Christopher Durkin[1], Ryan Harrington[2], Joash Gomes[2]

Affiliations: 1: University of British Columbia, Canada; 2: Vesalius Cardiovascular Inc

Background: Surgical mitral valve repair - chordal replacement and annular correction - is the gold standard therapy for mitral valve prolapse (degenerative mitral regurgitation - DMR), but because of operative risk, this therapy is not available to all patients in need. For high risk comorbid patients with DMR, a percutaneous transfemoral approach to mitral valve repair is an attractive option. While existing transfemoral solutions may have effectiveness for simple manifestations of DMR with little or no annular dilation, this represents only the minority of DMR patients. We have developed a transfemoral (for safety) and surgically-based (for effectiveness and durability) solution that can repair simple or complex DMR with or without annular dilation, employing a simplified concept for multisegment chordal replacement, to address this clinical need. We have previously reported proof of concept for our repair device, and here we report the performance characteristics of our device fixation technology – the papillary anchors and papillary anchor delivery system.

Objective: Our comprehensive repair concept requires intraventricular fixation of the device with anchors placed in opposing papillary muscles. Successful catheter-based beating heart delivery and stability of ventricular anchors has not been clinically reported. We designed and built a nitinol shape-memory anchor with a unique configuration that maximizes surface area, but expands atraumatically. For safe and predictable delivery, we designed a stabilized delivery catheter which, from the frame of reference of the catheter itself, eliminates cardiac motion, facilitating safe and precise anchor delivery within the beating heart. Both technologies were subjected to experimental analysis to assess the feasibility and durability of the anchor (group A), and the feasibility of the delivery system (group B).

Methods: After Institutional Animal Care Committee approval, juvenile female sheep (n=7) were anaesthetized and a left fourth interspace thoracotomy was performed to expose the left atrium. For group A (anchor feasibility and durability, n=5), animals were peripherally cannulated for cardiopulmonary bypass. Through the open atrium on the beating heart, nitinol anchors were deployed under direct vision into opposing papillary muscles using a simplified hand held prototype of the anchor delivery catheter. The anchors were then connected to the anterior leaflet of the mitral valve such that the load of the functioning valve was transferred onto the nitinol anchors. After separation from cardiopulmonary bypass, anchor stability and functionality were assessed with echocardiography by the absence of mitral regurgitation. Afterload was manipulated with IV noradrenaline to create "worst case scenario" hemodynamics. Animal #5 was revived from anaesthesia and assessed intermittently with transthoracic echocardiography, until planned euthanasia at 300 days for histological and mechanical assessment. For group B (delivery system feasibility, n=2), the delivery system was introduced into the beating ventricle through the closed atrium, and steered toward the papillary muscle, as guided by epicardial echocardiography. After confirming correct positioning, anchors were deployed.
Conclusions: In group A, nitinol anchors under a hemodynamic load showed stability and an absence of migration or injury to adjacent structures, as well as long term durability in a 300 day chronic experiment. In group B, feasibility is shown for the stabilized delivery system.

P11 – 11:10

Title: Improving surgical quality for patients with mental illnesses: a narrative review
Authors: Rebecca Afford[1], Chad Ball[5], Jesse Sidhu[3], Mypinder Sekhon[4], Morad Hameed[1,2,4] **Affiliations:**
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5. *Department of General Surgery, University of Calgary*
Background: Mental illness affects approximately 6.7 million Canadians. For them, stigma, comorbid disorders, and sequelae of psychiatric diagnoses can be barriers to receiving equitable healthcare. The goal of this review is to define inequities in surgical care for patients with pre-existing mental illness.
Objective: To establish and define disparities in care for patients presenting with surgical disease who have pre-existing mental health diagnoses.
Methods: We search OVID Medline, Pubmed, EMBASE, and the Cochrane Review files using a combination of search terms using a PICO (population, intervention, comparison, outcome) model focusing on surgical care for patients with mental illness.
Conclusions: The literature on mental illness in surgical patients focused primarily on preoperative and postoperative disparities in surgical care between patients with and without a diagnosis of mental illness. Preoperatively, patients were 7.5-40% less likely to be deemed surgical candidates, were less likely to receive testing, and were more likely to present at later stages of their disease or have delayed surgical care. Similar themes arose in the postoperative period: patients with mental illness were more likely to require ICU admission, were up to 3 times more likely to have a prolonged length of hospital stay, had a 14-270% increased likelihood of having postoperative complications, and had significantly higher healthcare costs.
Surgical patients with preexisting psychiatric diagnoses have a propensity for worse perioperative outcomes compared to patients without reported mental illness. Taking a thorough psychiatric history can potentially help surgical teams address disparities and access to care as well as anticipate and prevent adverse outcomes.

P12 – 11:20

Title: The Relationship Between Perceptions of Shared Decision-Making and Patient-Reported Outcomes in a Cross-Sectional Cohort of Hemorrhoidectomy Patients
Authors: Dr Khalil Merali, Dr Ahmer Karimuddin[1,2], Dr Trafford Crump[3], Dr Carl Brown[1,2], Dr Terry Phang[1,2], Dr Manoj Raval[1,2], Dr Guiping Liu[4], Dr Jason Sutherland[4,5]
Affiliations: 1: Department of Surgery, University of British Columbia; 2: Division of Colorectal Surgery, Providence Health Care; 3: Department of Surgery, University of Calgary; 4: School of Population and Public Health, University of British Columbia; 5: Centre for Health Services and Policy Research, University of British Columbia
Background
An important contributor to surgical outcomes is high quality preoperative patient-surgeon communication. Improved shared decision-making (SDM) can result in decreased surgical regret, along with an improvement in patient satisfaction. There is limited understanding as to how patients' symptom severity and lifestyle impairments influence their perceptions of surgeons' communication style and engagement. This may bear particular significant in elective surgical procedures performed for the purpose of improving quality of life.
Objective: This study aims to measure associations between patients' perceptions of the SDM process and health-related quality of life among a cohort of patients choosing surgical management of an elective surgical procedure, hemorrhoidectomy.
Methods: This study is a single site study based in Vancouver, Canada. Patients of five colorectal surgeons registered for elective hemorrhoidectomy between September 2016 and June 2020 were eligible to participate. Participants completed the CollaboRATE instrument which measures patients' perceptions of SDM after the surgical consultation along with a number of tools measuring patient-reported outcomes.
Results: The participation rate was 45.3% (N = 157). Unadjusted results found that participants having the most comorbidities reported better communication with their surgeon. The adjusted results show that socioeconomic status and depression were associated with lower CollaboRATE scores. There was no effect of sex, pain interference, anxiety or perceived health status on participants CollaboRATE scores.
Conclusion: This study found that participants with lower economic status or those reporting depressive symptoms had worse perceptions of SDM with their surgeon. These findings suggest that special attention should be paid to the SDM process for these patient populations.

P13 – 11:30

Title: Determining the current state of patient satisfaction, nutrition, and environmental impact with the inpatient menu at Vancouver General Hospital

Authors: Annie Lalande MD1, Keiko Patterson2, Stephanie Alexis2, Karina Spoyalo MD1, Morad Hameed MD MPH FRCSC FACS1,4, David Boyd PhD3,5, Navin Ramankutty PhD3,5, Jiaying Zhao PhD3,6, Andrea MacNeill MD MSc FRCSC1,4

Affiliations: 1Department of Surgery, University of British Columbia, Canada ; 2Faculty of Medicine, University of British Columbia, Canada; 3Institute for Resources, Environment and Sustainability, University of British Columbia, Canada; 4Vancouver General Hospital, Canada; 5School of Public Policy and Global Affairs, University of British Columbia, Canada; 6Department of Psychology, University of British Columbia, Canada.

Background: Poor diet is the main risk factor for numerous non-communicable illnesses, resulting in 11 million deaths annually around the world. Industrialized food systems, through food waste and meat-rich diets, are also one of the largest contributors to climate change, the greatest global health threat of the 21st century. Health care systems are strategically situated to mitigate climate change through the practice of so-called Planetary Health Care, and to leverage food as a determinant of health within hospitalized populations. Aligning hospital food systems with national dietary and planetary health diet guidelines would decrease their climate impacts and increase nutritional value, while simultaneously providing an opportunity to improve the notoriously poor patient satisfaction with hospital food. The latter contributes to poor oral intake and malnutrition in hospital, which is associated with longer hospital stays, higher rates of unplanned readmissions, and increased mortality. Hospital food systems are thus an important point of intervention for both mitigating health care's carbon footprint and improving nutrition- related outcomes of hospitalized patients.

Objective: The objectives of this project are to evaluate the current inpatient menu at Vancouver General Hospital (VGH) as it pertains to patient satisfaction, nutrition, short-term post-operative outcomes, and environmental impact, and to examine factors impacting patient food preferences. This represents the first step to the development and implementation a planetary health diet menu at VGH.

Methods: This project comprises two studies: a hospital-wide survey available to all patients admitted to VGH over the course of two months, and an observational study to evaluate the current state of patient satisfaction, nutrition, and food-related emissions and waste, in a sample population of 100 surgical inpatients at VGH.

Conclusions: Data collection is expected to conclude imminently for both projects. A preliminary analysis of the hospital-wide survey (n~275) demonstrates that food taste was the main driver of dissatisfaction and waste, while the study of surgical patients confirms high rates of wasted food; for instance, 38% of all served milk cups were unopened, and over 25L of milk was wasted during these patients' admission. This supports the notion that food is a major opportunity to enhance patients' experience, nutrition, and recovery in hospital while mitigating the healthcare footprint.

P14 – 11:40

Title: Circulating tumour DNA to detect lung cancer recurrence following surgery: a preliminary report

Authors: Anna L. McGuire[1,2], John English[2,3] , Stephen Yip[2,3,4], Barbara Melosky[4,5], Roy Hilzenrat[6], John Yee[1], Benjamin Furman[7], David Mulder[7], Kyle Grant[1], Melissa K. McConechy[7]

Affiliations: [1]Department of Surgery, Division of Thoracic Surgery, Vancouver General Hospital; 2Vancouver Coastal Health Research Institute; [3] Department of Pathology and Laboratory Medicine, University of British Columbia, [4]BC Cancer Genomics Laboratory; [5]Department of Medicine, Division of Medical Oncology BC Cancer Agency; [6]Department of Surgery, Division of General Surgery, University of British Columbia; [7]Canexia Health, Vancouver, BC, Canada.

Background: Lung cancer is the most common cause of cancer death annually in Canada for both males and females. Despite surgical treatment for early stage lung cancer at presentation, many go on to suffer recurrent cancer which shortens their lives. Novel targeted gene therapy is available for specific lung tumour genetic alterations in the event of recurrence that can extend life by years, with or without traditional cytotoxic chemotherapy. Following lung surgery for cancer, post-operative recurrence surveillance guidelines recommend computed tomography (CT) chest every 6 months for 2 years, followed by an annual CT chest to year five. CT chest surveillance often reveals false positive findings that are indistinguishable from inflammatory, infectious, or benign lung lesions. To guide management the patient may be exposed to invasive diagnostic lung biopsy with associated risks, or the lesion of concern on surveillance CT may not be targetable for tissue biopsy. The circulating tumor DNA (ctDNA) portion of cell free DNA found in the plasma of patients with cancer is proportional to stage and tumour burden. Liquid biopsy for ctDNA in patient blood is a non-invasive manner that may help distinguish malignant lesions found on surveillance CT chest, however this is yet to be determined.

Objective: To examine the utility of ctDNA to determine lung cancer recurrence in conjunction with standard CT scan surveillance.

Methods: A prospective cohort study at a tertiary level thoracic surgical centre was conducted. Consecutive adult patients with confirmed non-small-cell lung cancer (NSCLC) underwent next generation sequencing (NGS) using targeted cancer panels with matching gene content on their resected tumour tissue immediately after surgery and their blood at 12 months follow up in addition to standard of care CT chest surveillance. The tissue and blood amplicon cancer panels had matching mutation content to detect the eight most common lung cancer driver mutations: *EGFR, KRAS, BRAF, ALK, HER2, PIK3CA, RET, and MET*. The ctDNA results in patients with suspected recurrent disease on CT chest will be compared to tumor DNA as means to assess its feasibility in identifying recurrence.

Results: A total of 59 NSCLC patients were enrolled including 36 (61%) female. Median age was 68 years (range 43-83), with 21 (36%) never smokers. Lung histopathology revealed 49 (83%) adenocarcinoma, 9 (15%) squamous cell carcinoma (15%) and 1 NSCLC not otherwise specified (2%). On CT chest 7 (12%) presented with findings suspicious for recurrence at 12 months. In one of these cases (14%), the same EGFR exon 19 deletion mutation detected in surgical tumour tissue was detected in plasma ctDNA, confirming presence of recurrence. This mutation is targetable with osimertinib therapy.

Conclusions: These preliminary findings demonstrate feasibility in use of plasma ctDNA to confirm recurrent malignancy through non-invasive means.

P15 – 11:50

Title: Virtual and Augmented Reality in the Vestibular Rehabilitation of Peripheral Vestibular Disorders: Systematic Review and Meta-Analysis

Authors: Austin Heffernan, Mohammed Abdelmalek and Desmond A Nunez

Affiliations: University of British Columbia, Division of Otolaryngology – Head and Neck Surgery, (Department of Surgery), Vancouver, (British Columbia), Canada
Background: Dizziness is a common complaint affecting up to 23% of the population at any time in a first world setting. In publicly funded healthcare systems 0.8-1.7% of general practitioner attendances are for symptoms of dizziness or vertigo, 9-13% of whom are referred to other specialists such as neurologists, cardiologists and otolaryngologists. Disorders of the peripheral vestibular system are identified in 50%-65% of patients seen in specialist dizziness clinics. Vestibular rehabilitation is an established treatment for patients with peripheral vestibular disorders (PVD). Virtual reality (VR) and augmented reality (AR) can be utilized to deliver vestibular rehabilitation.
Objective: To determine the efficacy of VR and AR delivered vestibular rehabilitation in comparison to standard vestibular rehabilitation (SVR) in patients with PVDs.
Methods: A systematic review of MEDLINE, EMBASE, CENTRAL, CINAHL, PsychInfo, PsychBITE, OTSeeker, Ei Compendex, IEE, Clinical trials.gov and WebofScience databases was undertaken. Search terms included AR, VR, PVD and synonymous terms. Randomized controlled trials (RCT) that compared VR or AR vestibular rehabilitation interventions to SVR alone were included. Change in vestibular dysfunction symptoms 0-3 months post-intervention was the primary outcome. Secondary outcomes included long- term symptom change and treatment side effects. A risk of bias assessment and meta-analysis was planned.
Results: The search yielded 1235 articles; five RCTs were included. A meta-analysis on four of five RCTs identified a 1.13 (95% CI, -1.74, - 0.52) standardized mean difference reduction in dizziness handicap inventory (DHI) scores for VR and AR treated patients compared to controls 0-3 months post-intervention. No significant subgroup DHI differences between home-based VR (n = 2), in-clinic VR (n = 1) and AR (n = 1) were identified. Side effects were reduced by week four of VR interventions. DHI scores and side effects were at high risk or some concerns of bias.
Conclusions: VR and AR interventions reduced patient DHI scores more than SVR 0-3 months post-intervention. High quality studies are needed.

P16 – 12:00

Title: Evaluating the benefit of virtual surgical planning on operative time and patient outcomes in head and neck reconstructive surgery
Authors: Abhiram Cherukupalli MD MHSc, Linh Tran, Jamie Kwon, Eitan Prisman MD FRCSC
Affiliations: UBC Department of Surgery, Division of Otolaryngology-Head & Neck Surgery
Background: Traditionally, osteocutaneous flaps were shaped intraoperative through free-hand surgery performed under visual approximation. Poor estimates in flap harvest can lead to incomplete closure of defect, delayed OR time, tension on anastomosis and flap failure. Advancements in 3D printing have facilitated the use of virtual surgical planning to assist in precise pre-operative planning for head and neck surgery. However, there is limited data to evaluate comparisons in operative time and post- operative complication rates between both groups for oncologic reconstruction.
Objective: To evaluate and compare the operative time and complication rate between virtual surgical planning and free-hand surgery for mid-face and mandible bony reconstruction with fibular and scapular free flaps.
Methods: Retrospective data of all scapular and fibular free flap reconstructions at UBC was collected from Jan.1st 2015 – Jan.1st, 2020 and stratified into virtual surgical planning and free-hand surgery groups. Descriptive statistics and t-tests were used to evaluate for significant differences between tumor stage, OR time, tracheostomy, and length of stay.
Conclusions: A total of 136 and 84 patients were identified in the free-hand surgery and virtual surgical planning groups respectively. Our data showed a statistically significant difference in mean OR time (min) between free-hand surgery (364.6) and virtual surgical planning (266.2) with evidence of faster operations if virtual surgical planning was used ($p < 0.001$). Similarly, there was a significant difference in rate of tracheostomy (%) between the free-hand and virtual surgical planning cohorts respectively (83%, 30%), favoring a lower rate of tracheostomy in the virtual surgical planning cohort ($p < 0.001$).

P17 – 12:10

Title: Surgical coaching: Patient perspectives regarding physician coaches in the operating room
Authors: Mahraz Parvand[1], Rochelle Salvador[1,2], Brian Westerberg[1,2], Jane Lea[1,2]
Affiliations: 1. Division of Otolaryngology – Head & Neck Surgery, University of British Columbia; B.C. 2. BC Rotary Hearing & Balance Centre, St. Paul's Hospital, PHC.
Background: Surgical coaching programs have been introduced as platforms for ongoing professional development amongst independently practicing surgeons. While there is a plethora of evidence regarding the effectiveness of surgical coaching for practicing staff surgeons, patients' opinions regarding surgical coaching are largely unknown.
Objectives: To determine patients' baseline attitudes and opinions to the hypothetical situation of their treating surgeon having a surgical coach present during their upcoming operation, and to determine patients' baseline knowledge and exposure to physician coaches.
Methods: This study was conducted at St. Paul's Hospital, Vancouver, Canada. UBC Ethics approval was obtained. Patients on the surgical waitlist of two independently practicing Otolaryngologists within the subspeciality of Otology & Neurotology were invited to participate in the study. Participants engaged in a semi-structured interview to discuss their opinions and knowledge of physician coaches and to learn about surgical coaching. The interview was conducted as a questionnaire, based on a pre-set script.
Results: Of the 100 patients approached, 70 consented to participate. Forty-three (61%) participants identified as female, and the mean age was 56±15 years. Initially, 84% of participants (n=59) consented to the hypothetical presence of a surgical coach. Post-discussion, this number significantly increased to 95.7% (n=67, p=0.04). Prior participant exposure to coaching related to employment, education, athletics, or music was 90% (n=63). Younger participants between 25-45 years old were more amenable to the presence of a surgical coach compared to participants >66 years of age (p=0.01). After the interview, 55 (79%) participants were interested to learn more about surgical coaching.
Conclusion: The majority of patients were amenable to the presence of a surgical coach during their surgery, and this number increased with patient education about surgical coaching. Many patients were unaware of the rationale and importance of surgical coaching programs for practicing staff surgeons.

P18 – 12:20

Title: Medico-legal Closed Case Trends in Canadian Plastic Surgery: A Retrospective Descriptive Study Zach Zhang[1] MD[1]

Authors: Lisa Calder[2,3] MD MSc FRCPC, PJ Finestone[2] RN CPPS Richard Liu[2] MCS Marija Bucevska[1] MD, Jugpal Arneja[1] MD, MBA, FAAP, FACS, FRCSC

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Background: To enhance patient safety and prevent medico-legal complaints, we need to understand current trends and impacts. We aimed to characterize Canadian plastic surgery medico-legal patterns in many dimensions.

Method: This retrospective descriptive analysis of Canadian Medical Protective Association data between January 1, 2013 and December 31, 2017 included closed regulatory body complaints and civil- legal actions involving plastic surgeons. We excluded class action legal cases and hospital complaints. We collected data on patient allegations, procedure types, healthcare-related patient harms, and peer expert criticisms. The primary outcome of interest was physician medico-legal outcome.

Results: We found 414 cases that met the inclusion criteria: 253 (61.1%) cases involved cosmetic procedures and 161 (38.9%) noncosmetic procedures. The annual incidence among plastic surgeon members of regulatory body complaints and civil-legal actions was 12.1% and 6.7%, for a combined incidence of 18.8%. The most common allegations were deficient clinical assessment, inadequate informed consent, delayed or misdiagnosis, and inadequate monitoring. Leading contributing factors were physician–patient communication breakdown, deficient clinical judgments, and inadequate documentation. The top procedural complications included cosmetic deformity, poor scarring, upper extremity stiffness or deficit, major structural injury, and mental health disorder. Less than half of cases (198/414, 47.8%) had unfavorable medico-legal outcomes for the surgeon. Patients were compensated in 86/198 (43.4%) of civil-legal cases.

Conclusions: Plastic surgeons experience more medico-legal complaints for cosmetic versus noncosmetic procedures. To minimize medico-legal risks, plastic surgeons should focus on strong physician–patient communication, patient education/ consent, thorough clinical assessment, minimizing potentially preventable complications, and maintaining relevant documentation.

P19 – 12:30

Title: Population-based phase II trial of Stereotactic Ablative Radiotherapy (SABR) for up to 5 Oligometastases: Primary Toxicity Results of the SABR-5 Trial

Authors:

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Background: After the publication of the landmark SABR-COMET trial, concerns were raised over high- grade toxicity of SABR for oligometastases.

Objective: This population-based study was designed as a bridge from phase II to phase III trials, with the primary objective to document toxicity of SABR in a larger cohort from a population-based program.

Methods: From November 2016 to July 2020, 399 patients across British Columbia (BC) were enrolled in this single arm, phase II trial of SABR in patients with oligometastatic or oligo-progressive disease.

During this period, patients were only eligible for SABR in these settings on trial within BC, and therefore this analysis is population-based, with resultant minimal selection bias in comparison to previously published SABR series.

Results: The median follow-up was 28 months. The mean age was 68 years (SD 11.1, range 30-97). The most common histologies were prostate cancer (32%), colorectal cancer (14%), breast cancer (11%), and lung cancer (9%). The number of SABR treated sites were one (69.2%), two (21.3%), and three or more (9.4%). The most common sites of SABR were lung (32%), non-spine bone (30%), spine (15%), lymph nodes (11%), liver (5%) and adrenal (4%). Grade 2, 3, 4, and 5 toxicity cumulative incidences were 14.2%, 4.2%, 0%, and 0.3% respectively. The highest rate of grade 3+ toxicities were in liver (13.6%) and adrenal (6.7%) metastates.

Conclusions: As defined *a priori,* SABR for oligometastatic disease was relatively safe in this provincially coordinated population-based phase II trial with rates of grade 2+, 3+, 4+, 5+ of <20%, <5%, <0.5%, and <0.5%, respectively. These results are encouraging that in a program with rigorous peer review quality assurance and prioritization of meeting OAR constraints over tumour target coverage, SABR is associated with acceptable rates of toxicity. This supports further enrollment in randomized phase III trials, with specific focus on safety in liver and adrenal metastases.

P20 – 13:10

Title: Repeat Transcatheter Aortic Valve Replacement: Insights from the United States Medicare Database

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Medical Center, New York Presbyterian Hospital, New York, New York; [8]Division of Cardiology, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Background: Repeat transcatheter aortic valve replacement (TAVR) is a growing option in patients requiring reintervention for TAVR. However, large-scale studies with longitudinal follow-up are limited.
Objective: We sought to examine real-world experience with repeat TAVR in a population-based, national database.
Methods: All Medicare beneficiaries who underwent TAVR from 2012 to 2017 were included. Outcomes included 30-day and longitudinal mortality and major adverse cardiac events (MACE), defined as death, stroke, pacemaker insertion, major bleeding, acute kidney injury, or cardiac arrest. Outcomes of repeat TAVR were compared to surgical explant after TAVR (TAVR-explant) in a matched analysis.
Results: Of 133,250 patients who underwent TAVR, 617 (0.46%) underwent subsequent repeat TAVR at median interval of 154 days (IQR 58-537). Mortality at 30-days and 1-year was 6.0% and 22.0%, respectively. Rates of 30-day stroke and pacemaker insertion were 1.8% and 4.2%. Mortality at 30-days was lower in those who underwent their first TAVR during the later era (2015-2017) compared to earlier years (2012-2014) (4.6% vs. 8.7%, p=0.049). Repeat TAVR was associated with lower 30-day mortality compared to a matched group undergoing TAVR-explant (6.2% vs. 12.3%, p=0.05), although 1-year mortality was similar (21.0% vs. 20.8%, p=1.000). The incidence of 30-day MACE was higher in TAVR- explant compared to repeat TAVR (RR 2.92, 95% CI 1.88-4.99, p ≤0.001).
Conclusions: Repeat TAVR was performed with acceptable 30-day mortality in this high-risk population. Short-term outcomes were superior to surgical explant, but one-year outcomes were similar. Repeat TAVR will likely be an important option for aortic valve reintervention after TAVR.

P21 – 13:20

Title: Do rectal cancer patients "regret nothing"? Decisional regret after organ-preservation therapy in rectal cancer

Authors: Ameer Farooq MD MPH FRCSC[1], Ahmer Karimuddin[1], MD FRCSC, Nathan Lee[1], Terry Phang[1] MD FRCSC, Manoj Raval[1] MD FRCSC, Carl Brown MD MSc FRCSC FACS[1]
Affiliations: 1- Division of Colorectal Surgery, Department of Surgery, St. Paul's Hospital, University of British Columbia, Vancouver, BC

Background: There are several organ-preserving (OP) strategies for rectal cancer, such local excision and non-operative management (NOM). With an increased number of treatment options, the complexity of shared decision-making in rectal cancer has increased. These novel therapies are challenging to explain to patients and their understanding of the risks of an OP strategy has been questioned. In addition to concerns around recurrence, there are potential new challenges from a patient perspective that did not exist in standard treatment regimens, such as frequent surveillance. Regret is the highly negative, situation-specific feeling that the outcome would have been better had the patient made a better decision. It is unclear the degree to which patients undergoing OP experience regret. The purpose of this study was investigated decisional regret in rectal cancer patients undergoing OP and radical resection (RR).
Objective: We investigated decisional regret in rectal cancer patients undergoing OP and radical resection (RR).
Methods: We surveyed patients diagnosed with rectal cancer at St. Paul's Hospital who underwent OP between 2015 and 2020. All NOM patients had complete response to neoadjuvant therapy. Our comparator group was patients who underwent RR with a pathologic complete response. We utilized a validated score for regret, the decision-regret scale (DRS). Multivariable linear regression was used to examine for factors associated with regret.
Conclusions: A total of 89 patients were identified as meeting study criteria. Of these, 58 patients agreed to be recruited into the study, with 53 ultimately completing the questionnaire (59.6% response rate). Twenty-three patients from 2010 to 2020 underwent OP and 30 underwent RR. Regret was low in both groups, with OP having lower regret than those that underwent RR (OP median 5, interquartile range 0 -20 vs RR 20, IQR 10 - 40, p = 0.0376). Nine patients underwent OP followed by RR, with no significant difference (median DRS 30, IQR 15 - 50 vs 10, IQR 0 - 45, p = 0.12).
Regret was low in both groups, with OP having lower regret than those that underwent RR (OP median 5, interquartile range 0 -20 vs RR 20, IQR 10 - 40, p = 0.0376). Nine patients underwent OP followed by
RR, with no significant difference (median DRS 30, IQR 15 - 50 vs 10, IQR 0 - 45, p = 0.12). Univariate analysis revealed complications (p=0.015) and worsening functioning as measured by Functional Assessment of Cancer Therapy (FACT) scores (p = 0.0036) to be associated with high levels of regret. On regression, only the Charlson Comorbidity Index (CCI) and worse FACT scores were found to be significantly associated with regret.
This study was limited by its retrospective design and small numbers. Based on previous studies in this area, we expected to find high levels of regret in the patients who underwent radical resection for a complete pathological response. While we did find a trend towards lower levels of regret in OP patients, there were generally low levels of regret in the RR group as well. Importantly, patients who underwent an OP strategy that ultimately required RR had low levels of regret as well. This is important to convey to patients when counselling on possible strategies in their treatment. Further investigation should focus on patient-centred outcomes and improving shared decision-making strategies.

P22 – 13:30

Title: Lung Transplantion for COVID-19 Induced Pulmonary Fibrosis: The First Canadian Series

Authors: Roy Hilzenrat MD[1], James Choi MD MPH[2], Anna McGuire MD MSc[2,3], John Yee MDCM[2]
Affiliations:
1Faculty of Medicine, Department of Surgery, Division of General Surgery, University of British Columbia
2Division of Thoracic Surgery, Department of Surgery, Vancouver General Hospital
3Vancouver Coastal Health Research Institute

Background: Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to a global pandemic, halting normalcy within medical practice. Most affected individuals experience mild illness, however 5-10% require intensive care unit (ICU) admission for respiratory support. In this critically ill subgroup mortality is up to 60%. Emerging data globally reveals a proportion go on to develop end-stage pulmonary fibrosis. Lung transplant improves survival for end-stage respiratory failure due to emphysema and pulmonary fibrosis. However, there is a paucity data on outcomes following lung transplantion in the setting of COVID-19 pulmonary fibrosis.

We hypothesize that as COVID-19 becomes endemic and new variants emerge, we will observe an increasing proportion of indivuals with end stage pulmonary fibrosis complicating COVID-19 pneumonia who meet criteria for lung transplantation.
Objective: To describe the clinical pathological features and perioperative outcomes of the first Canadian series of patients undergoing lung transplantation for COVID-19 associated end-stage pulmonary fibrosis.
Methods: A retrospective single-arm cohort study was conducted at Vancouver General Hospital, Division of Thoracic Surgery from June 2020 to September 2021. Patients who underwent lung transplant for the indication of COVID-19 associated pulmonary fibrosis were identified from review of the Solid Organ Transplant (SOT) database. Variables of interest include extra-corporeal membrane oxygenation (ECMO) bridge to transplant and duration of ECMO run, age, sex, and charlson comorbid index, and postoperative adverse events including hemorrhage, thrombotic events, sepsis, recannulation and reintubation. Categorical varibles are expressed as counts (%) and continuous as median (range). Univariable analyses are considered exploratory.
Results: Seven patients underwent bilateral lung transplant at VGH for pulmonary fibrosis complicating COVID-19 during the study period. 5 (71%) men and 2 (29%) women. Median age was 52 [range, 31-59] years. One patient (14%) had documented lung disease (sarcoidosis) prior to their COVID-19 diagnosis. 6 (86%) patients required ECMO bridge to transplant, all of which (100%) were successfully bridged to transplant. The median duration of ECMO run was 87 [range, 32-98] days and median time to liberation from ECMO post-operatively was 7 [range, 0-34] days. 2 patients (29%) required re-operative intervention. 30d survival was 100%.
Conclusions: This report serves to deepen our understanding of lung transplantation for a new disease: pulmonary fibrosis due to COVID-19 pneumonia. The findings of this series will inform a subsequent comparative study examining clinical outcomes of lung transplantation for pulmonary fibrosis due to COVID-19 pneumonia versus non-COVID interstitial lung disease.

P23 – 13:40

Title: MR Tractography-Based Targeting and Physiological Identification of the Cuneiform Nucleus for Directional DBS in a Parkinson's Disease Patient with Levodopa-Resistant Freezing of Gait
Authors: Stephano Chang[1], Iahn Cajigas[2], James Guest[2], Brian Noga[2], Eva Widerström-Noga[2], Ihtsham Haq[3], Letitia Fisher[2], Corneliu Luca[3], Jonathan Jagid[2]
Affiliations: [1]Division of Neurosurgery, Department of Surgery, University of British Columbia [2]Department of Neurological Surgery, University of Miami Miller School of Medicine [3]Department of Neurology, University of Miami Miller School of Medicine
Background: Freezing of gait (FOG) is a debilitating deficit in a subset of Parkinson's Disease (PD) patients that is poorly responsive to levodopa or deep brain stimulation (DBS) of established PD targets. The proposal of a DBS target in the midbrain, known as the pedunculopontine nucleus (PPN), to address FOG was based on its observed neuropathology in PD and its hypothesized involvement in locomotor control as a part of the mesencephalic locomotor region (MLR). Initial reports of PPN DBS were met with enthusiasm; however, subsequent studies reported mixed results. A review of the MLR basic science literature suggests that the closely related cuneiform nucleus (CnF), dorsal to the PPN, may be a superior site to promote gait. Although suspected to have a conserved role in the control of gait in humans, deliberate stimulation of a homolog to the CnF in humans using directional DBS electrodes has not been attempted.
Objective: To target and characterize directional DBS of the CnF in a subject with levodopa-resistant FOG.
Methods: As part of an open-label Phase 1 clinical study, one PD patient with severe FOG refractory to levodopa was implanted with directional DBS electrodes (Boston Science Vercise CartesiaTM) targeting the CnF bilaterally. Since the CnF is a poorly defined reticular nucleus, targeting was guided both by diffusion tensor imaging (DTI) tractography and anatomical landmarks. Intraoperative stimulation and LFP recordings were performed with leg EMG surface recordings. Clinicaltrials.gov: NCT04218526.
Results: Post-operative imaging revealed accurate targeting of both leads to the designated CnF. Intraoperative stimulation near the target at low thresholds in the awake patient evoked involuntary electromyography (EMG) oscillations in the legs with a peak power at the stimulation frequency, similar to observations with CnF DBS in animals. Preliminary gait testing results demonstrated improved Timed Up and Go, among other gait and turning parameters. Oscillopsia was evoked at higher currents, especially when directed posterolaterally, and could be mitigated with Directional DBS.
Conclusions: DTI-based targeting and intraoperative stimulation to evoke limb EMG activity may be useful methods to help target the CnF accurately and safely. Long-term follow-up and detailed gait testing of patients undergoing CnF stimulation will be necessary to confirm the effects on FOG.

P24 – 13:50

Title: Two-Team vs. Single Surgeon Free Flap Reconstruction of the Head & Neck: A Case for Teamwork & Potential Cost-Savings
Authors: Emily C. Deane[1], MD, Sally Nguyen[1], FRCSC, Kevin Zhao[1], MD, Alice Liu[1], MD, Jamie Kwon[1], Jenny Gui[1], Donald W. Anderson[1], FRCSC, J. Scott Durham[1], FRCSC, Eitan Prisman[1], FRCSC
Affiliations: 1. Division of Otolaryngology Head & Neck Surgery, University of British Columbia, Vancouver, Canada
Background: Complex head and neck cancer defects can be reconstructed using free tissue transfer from an out-of-field autologous donor site. Historically, a single surgeon accomplished both the ablative and free flap reconstructive components of these surgeries in sequence. In recent years, a two-team approach, wherein one surgeon carries out the resection of the tumour and a second surgeon the reconstruction of the defect, has increased in popularity.
Objectives: To investigate the benefit of two surgeon-lead teams in operating room efficiency, post- operative outcomes and the potential for cost savings in head and neck reconstruction
Methods: Retrospective series of consecutive head and neck free flap reconstruction at Vancouver General Hospital between 2015 and 2021. Cases were categorized as single surgeon versus two-team and were compared for disease characteristics, anesthetic and operative time, and post-operative outcomes.
Results: Five-hundred seventy-seven consecutive free flaps were performed (n= 262 single surgeon, n=315 two-team) during this period. There were no differences in patient demographic or disease characteristics. There was a larger proportion of fibula free flap reconstructions done by the two-team group (32.3% vs. 13.7%, $p<0.05$). A two-team approach enabled significantly reduced operative and anesthetic times, with reductions of 28.0% and 22.9%, or 90 minutes and 97 minutes, respectively ($p<0.0001$). There were non-significant differences in post-operative complication rates. Length of stay was similar in both groups.

Conclusions: A two-team approach was associated with significantly lower operative and anesthetic times, despite a higher proportion of bony free tissue transfer, which are notoriously more technically complex. Reducing overall operative time may allow for improved utilization of precious hospital infrastructural resources, personnel and costs, while also potentially lowering the risk of perioperative complications associated with increased anesthetic time.

P25 – 14:00

Title: Clinical Decision Analysis for Post-Mastectomy Alloplastic Breast Reconstruction in the setting of Radiation Therapy: A Markov Model.
Authors: Janine Roller MD, Kathryn V. Isaac MD, FRCSC, MPH.
Affiliations: Division of Plastic Surgery, Department of Surgery, University of British Columbia, Vancouver, BC
Background: Pre-pectoral alloplastic breast reconstruction has emerged as increasingly popular and widely performed technique. As compared to sub-pectoral alloplastic reconstruction, advantages of pre- pectoral prosthesis placement include reduced pain, preservation of pectoralis muscle, and elimination of the animation deformity. For patients requiring adjuvant radiation, it is not established whether the optimal plane for the prosthesis is pre-pectoral or subpectoral.
Objective: A Markov model was designed to guide the optimal treatment strategy in patients desiring alloplastic immediate breast reconstruction (IBR) who require adjuvant radiation.
Methods: A systematic review was conducted to establish the probability of complications and the measurable benefits of immediate 2-stage breast reconstruction in each the pre-pectoral and subpectoral planes. Benefits of each technique were defined by the utility of the reconstruction in this patient population. Complications included infection, mastectomy flap necrosis (MFN), capsular contracture (CC), and implant loss. A Markov Model was designed to determine which surgical plane is optimal for 2-stage alloplastic IBR in the setting of adjuvant radiation comparing the 2 treatment strategies of sub-pectoral and pre-pectoral techniques. Each strategy was modeled with the evidence-based probabilities of being in a health state with complications (infection, MFN, CC), in a terminal health state (implant loss), and utilities associated with each state and a successful reconstruction. The model was designed to select the optimal strategy to maximize health, as measured by utility, from the perspective of the decision-maker, the clinician. Model design and analysis was completed using TreeAge software.
Conclusions: The clinical scenario (base case) was a 45-year female with planned adjuvant radiation, undergoing immediate 2-stage alloplastic breast reconstruction with a life expectancy of 81.1 years. Based on the inputs of each treatment technique, the Markov model analysis identified subpectoral breast reconstruction as the optimal strategy in our base case to maximize utility. Subpectoral breast reconstruction led to a total of 22.1 Quality adjusted life years (QALYs), compared to 21.3 QALYs for pre- pectoral breast reconstruction. Two-way sensitivity analyses were performed with variances specified for the utility of acute complications and probabilities of acute complications. With decreasing probability of MFN (from baseline of 15.4% in pre-pectoral and baseline 3.4% in subpectoral), pre- pectoral reconstruction surpassed subpectoral reconstruction as the optimal strategy when the probability of MFN was reduced to 5.5%. Based on a clinical decision model to maximize utility, subpectoral breast reconstruction is identified as the optimal strategy in the setting of radiation therapy and 2-stage alloplastic breast reconstruction. This model highlights the importance of MFN as a driving influence of this decision strategy. Future directions will include a cost-effectiveness analysis of these two strategies in both the settings of radiation and no radiation treatment.

P26 – 14:10

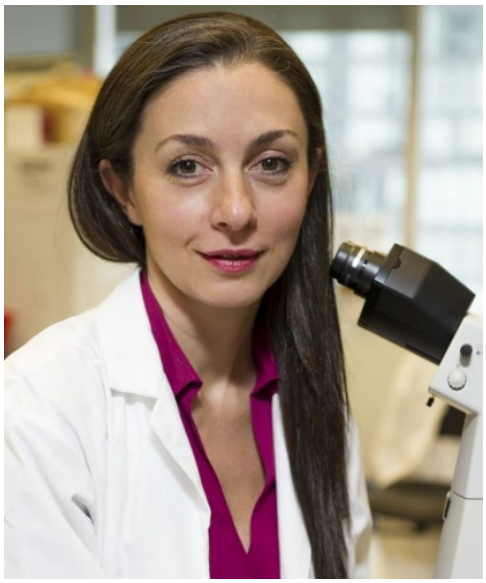
Title: Population-Based Analysis of Outcomes for Patients with Brain Metastases from Epidermal Growth Factor Receptor Mutation Positive Non-Small Cell Lung Cancer Treated With Tyrosine Kinase Inhibitor Alone or Combined with Radiotherary.
T. Kong1,2, A. Nichol1,2, C. Ho1,3, A. Benny4, N. Chooback5, I. M. Fraser6, L. Gondara1,7, and S. Lefresne1,2; *1BC Cancer Agency, Vancouver, BC, Canada, 2Division of Radiation Oncology, Department of Surgery, University of British Columbia, Vancouver, BC, Canada, 3Division of Medical*
Oncology, Department of Medicine, University of British Columbia, Vancouver, BC, Canada, 4Faculty of Medicine, University of British Columbia, Prince George, BC, Canada, 5Division of Medical Oncology, Queen's University, Kingston, BC, Canada, 6Northern Devon Healthcare (NHS), Clinical Oncology, Exeter, Devon, United Kingdom, 7BC Cancer Surveillance and Outcomes Unit, Department of Population Outcomes, Vancouver, BC, Canada
Purpose: With modern therapies, the median survival of patients with brain metastases (BrM) from non-small cell lung cancer (NSCLC) with epidermal growth factor receptor mutation (EGFRm) may exceed 1-2 years.
BrM directed therapies must therefore carefully balance treatment efficacy and late toxicity. Although some tyrosine kinase inhibitors (TKI) exhibit intracranial activity, there is no level-one evidence to support up-front treatment of BrM using TKI without radiotherapy (RT). This study aimed to compare the outcomes of patients with BrM from EGFRm NSCLC treated with initial RT and TKI, versus TKI alone.
Materials & Methods: All patients who received a TKI (gefitinib, erlotinib, afatinib, or osimertinib) in British Columbia for NSCLC between January 2010 to 2018 were identified in a provincial pharmacy database. Patients were then screened for pathologic diagnosis of EGFRm, and radiologic diagnosis of BrM. These patients were categorized as receiving either TKI alone or RT with TKI for treatment of their BrM. Patients who received RT were cross-referenced with a provincial RT database to determine RT prescriptions and were classified as having received whole brain (WBRT) with TKI or stereotactic RT/radiosurgery (SRS) with TKI. Patients were excluded if they discontinued TKI after RT or ever received surgery for BrM. Overall survival (OS) and intracranial progression free survival (iPFS) were calculated from the date of BrM diagnosis using Kaplan-Meier analysis. Log rank test was used for comparison between groups, and Cox proportional hazards model was used for multivariate analysis.
Results: A total of 167 patients were included for analysis with a median follow up of 45 months. Median OS was 19 months with WBRT (n=76), 21 months with SRS (n=45), and 6 months with TKI alone (n= 46), $p < 0.01$. In patients who had WBRT, iPFS was better than in those having TKI alone [HR 4.68 (2.07-10.56); $p < 0.01$] or SRS [HR 2.43 (1.20-4.91); $p < 0.01$]. On multivariate analysis: advanced age, worse performance status, presence of extracranial metastasis, greater than 10 BrM, and type of treatment (TKI alone versus RT with TKI) were associated with inferior OS.
Conclusion: This study showed that compared to treatment with TKI alone, the addition of RT for BrM is associated with an improved OS in patients with EGFRm NSCLC. These results are complementary to the growing body of retrospective data suggesting an inferior survival

associated with TKI alone compared to RT with TKI for treatment of BrM in patients with EGFRm NSCLC. Prospective studies are required to further guide the best approach to managing this patient population.

P27 – 14:20

Title: Evaluation of Factors Associated with Limb Thrombus Formation Post-Endovascular Aortic Aneurysm Repair
Authors: Sally HJ Choi, Kian Draper, Adrian Fung, Keith Baxter, David Taylor, Jerry Chen, Jonathan Misskey
Affiliations: Division of Vascular Surgery, University of British Columbia, Vancouver, BC
Background: Increasing experience with endovascular aortic aneurysm repair (EVAR) has raised growing concerns about limb thrombus formation.
Objective: Our objective was to determine the incidence of limb thrombus and to evaluate if any demographic, anatomic, or graft variables were associated with higher rates of limb thrombus.
Methods: Retrospective review of patients that underwent EVAR at Vancouver General Hospital between Jan 2010-Dec 2018 was carried out. The frequency of limb thrombus was recorded, and multiple variables were analyzed for associations with limb thrombus.
Results: A total of 301 patients were included with average follow-up of 27.6±4.9 months. The mean age was 76.5±0.5 years and 84% were male. Twenty-two (7.3%) patients had limb thrombus and of these, 11 (50%) had occlusive limb thrombus, 14 (63.6%) were symptomatic, and 17 (77.3%) required interventions. Patients with limb thrombus were younger (69.8±1.3 years vs. 77.1±0.5 years, $p<0.0001$) and more likely to be smokers (10.2% vs. 5.2%, $p=0.10$). Cook Alpha grafts had higher rates of limb thrombus (10.7%) compared to non-Cook grafts (4.0%), with a trend towards significance ($p=0.07$).
Right-sided limb thrombus was more likely in smaller right iliac arteries (14.7±0.9cm vs. 17.0±0.6cm, $p<0.05$), with a similar finding on the left (13.6±0.9cm vs. 15.2±0.4cm, $p=0.13$). Unilateral limb thrombus was almost twice as likely on the main body side compared to the contralateral side (11 vs. 6). Aortoiliac disease, limb extension into external iliac artery or non-matching heights of the limbs were not associated with higher rates of limb thrombus ($p>0.05$). Limb thrombus was not associated with increased 30-day mortality ($p>0.05$).
Conclusions: Limb thrombus formation is a prevalent complication post-EVAR (7.3%) and was seen more frequently in younger patients and in smokers. Cook Alpha grafts were associated with higher rates of limb thrombus. Limb thrombus was more likely in smaller iliac arteries and on the main body side.

Chung Keynote Speaker 2021



Dr. Gelareh Zadeh, MD, PhD, FRCS(C), FAANS

Professor and Dan Chair, Neurosurgery, University of Toronto
Head, Division of Neurosurgery, Toronto Western Hospital
Co-Director, Krembil Brain Institute, University Health Network
Senior Scientist, Princess Margaret Cancer Research Institute
Chair, Wilkins Family Brain Tumor Research
President, Society of Neuro-Oncology (SNO) 2020/21
Editor-in-Chief, Neuro-Oncology Advances, Journal of SNO & EANO

Dr. Gelareh Zadeh is Dan Family Chair and Professor of Neurosurgery, University of Toronto. She is Head of the Department of Neurosurgery at Toronto Western Hospital and Co-Director for the Krembil Brain Institute at University Health Network. Dr. Zadeh is a Senior Scientist at Princess Margaret Cancer Centre where she runs a translational research program at MacFeeters-Hamilton Neuro-oncology Program and holds the Wilkins Family Brain Tumor Research Chair.

Dr. Zadeh has a dedicated neuro-oncology and skull base practice, which includes a number of multidisciplinary specialized programs including a skull base clinic, brain metastases, pituitary clinic, and neurofibromatosis clinics. In parallel, she has an active research laboratory focusing on integrated multi-platform molecular analysis of brain tumors, together with a focus on understanding molecular response to targeted therapies, such as anti-angiogenesis and metabolic inhibitors. She is also involved in a number of national and international organizations. She is President of Society of Neuro-Oncology (SNO), and the past Chair of Neuro-oncology Committee at the World Federation of Neurological Surgeons, she is the Co-Chair and founder of the International Consortium on Meningiomas (ICOM). She is the Editor-in-Chief of Neuro-Oncology Advances, open access journal of SNO and EANO.

A History of the Chung Lectureship

In 1995, Madeline and Wally Chung made a generous donation to the Department of Surgery at the University of British Columbia. The purpose of the donation was to support an annual UBC Department of Surgery research day and invite the W.B. & M.H. Chung Lecturer to present new academic work as well as judge academic productivity, not only by the residents but also by the faculty. The Department is grateful for this wonderful legacy that Madeline and Wally Chung have left for the Department.

1995 Lloyd MacLean, Department Head, Surgery, McGill University and President of the American College of Surgeons

1996 John Duff, University of Western Ontario: *"Multisystem organ failure: manifestations and mediators"*

1997 K. Wayne Johnston, University of Toronto
"Issues in the management of abdominal aortic aneurysms in a rapidly changing health care environment"

1998 Charles H. Tator, Professor and Chair, Division of Neurosurgery, The Toronto Hospital: *"The breadth of surgical research in the 1990's"*

1999 Garth Warnock, Chief General Surgery, University of Alberta Hospitals, Director, Division of Surgical Research, University of Alberta
"Progress in transplantation of insulin-secreting tissues for diabetes mellitus"

2000 Paul Walker, Vice President, Toronto General Hospital
Professor of Surgery and Laboratory Medicine, Pathobiology, University of Toronto
"The continuing challenge of sepsis"

2001 James C. Thompson, Ashbel Smith Professor of Surgery, University of Texas Medical Branch
"Endocrine tumors of the pancreas"

2002 Richard J. Finley, Professor, Department of Surgery
Head, Division of Thoracic Surgery, University of British Columbia
"Future of image guided minimally invasive thoracic surgery"

2003 Douglas W. Wilmore, Frank Sawyer Professor of Surgery, Department of Surgery
Brigham and Women's Hospital, Boston, Massachusetts
"The pathophysiology and treatment of intestinal failure"

2004 John Wong, Chair of Surgery & Head, Department of Surgery
University of Hong Kong Medical Centre, Queen Mary Hospital, Hong Kong
"Complications of esophagectomy: confess and remember"

2005 Richard K. Reznick, R.S. McLaughlin, Professor and Chair, University of Toronto
Department of Surgery, Banting Institute, Toronto, Ontario
"Surgical training in 35 hours per week: laudable or lunacy?

2006 James T. Rutka, Janes Visiting Professor in Surgery, Dan Family Chair in Neurosurgery, Professor and Chairman,
Division of Neurosurgery, University of Toronto
"Astrocytoma invasiveness: molecular mechanisms form the leading edge"

2007 Markus W. Büchler, Professor of Surgery, Division of General Surgery
Chairman Surgical Unit, University of Heidelberg
"Evidence based pancreatic surgery"

2008 Thomas M. Krummel, Emile Holman Professor and Chair, Stanford University School of Medicine, Department of Surgery
Susan B. Ford Surgeon in Chief, Lucile Packard Children's Hospital, Stanford, CA
"From Blood and Guts to Bits, Bytes and Beyond-- Upgrading the Surgical Apprentice Model"

2009 Andrea L. Pusic, Assistant Attending Surgeon, Plastic and Reconstructive Surgery, Memorial Sloan-Kettering Cancer Center, New York
"Measuring patient reported outcomes in surgery"

2010 Yvan Douville, Chief, Department of Surgery, University of Laval
"Evolution of Stentgraft for Treatment of Abdominal Aortic Aneurysms"

2011 Gerald Fried, Chair, Department of Surgery, McGill University
"Teaching Billy how to operate: can we do better?"

2012 Haile Debas, Executive Director of UCSF Global Health Sciences (GHS); former Dean of the UCSF School of Medicine (1993-2003); former Chair, UCSF Department of Surgery . *"Precious Times"*

2013 Lorelei Lingard, Professor and Director of the Centre for Education Research & Innovation, Schulich School of Medicine & Dentistry, Western University, London, ON
"Beyond communication skills: A rhetorical approach to communication for advancing the practice and teaching of teamwork"

2014 Thomas Waddell, Chair, Division of Thoracic Surgery, University of Toronto, Professor, Department of Surgery, University of Toronto
Head, Division of Thoracic Surgery, UHN, Senior Scientist, Toronto General Research Institute, UHN
"The role of research training in surgical education".

2015 Garnett Sutherland, Professor, Clinical Neurosciences, University of Calgary, Founder and Director, Seaman Family MR Research Centre, Alberta Heath Services. *"Magnetic resonance imaging and robotic surgery."*

2016 Dr. Ivar Mendez, Fred H. Wigmore Professor and Unified Head of the Department of Surgery at the University of Saskatchewan – *"Robotic and distance tele-mentoring surgery."*

2017 Dr. Michael Tymianski, Head of UHN's Division of Neurosurgery and Senior Scientist at the Krembil Research Institute
Dr. Wendy Lai, President of Mèdecins Sans Frontières (Doctors Without Borders) Canada

2018 Dr. Richard Reznick, Dean, Faculty of Health Sciences Queen's University and CEO, Southeastern Ontario Academic Medical Association
"Large scale educational change: difficult, but doable."

2019 Dr. Teodor Grantcharov, Professor of Surgery, University of Toronto. "Surgical innovation, surgical education and patient safety"

2020 Dr. Melanie Morris, Medical Director, Global Surgery Office, University of Manitoba and Lead, Indigenous Health, The Children's Hospital of Winnipeg. "Something to Imagine: Equity in Pediatric Surgery."

2021 Department of Surgery Faculty Achievement Awards

Hjalmar Johnson New Investigator Award – Dr. Andrew Thamboo

Dr. Andrew Thamboo is a proud graduate of the UBC medical school and otolaryngology program. He also completed a degree in Masters in Health Sciences concentrating on study design and epidemiology during his residency. He has been awarded a number of distinguishing awards in his short career such as the Dr. I.B. Holubitsky Memorial Award for demonstrating the highest of surgical excellence at UBC. Dr. Thamboo did his Rhinology and Skull Base Fellowship at Stanford University. Clinically, Dr. Thamboo manages tertiary referrals from his colleagues or other tertiary specialists (such as allergist and respirologists). He deals with patients with complex sinus disease and sinonasal tumors. Dr. Thamboo is a national and international leader in this field. Dr. Thamboo is the Research Director of the St. Paul's Sinus Centre. In collaboration with Respirologists, he has a lab associated with Heart and Lung Institute. Dr. Thamboo has an interest in areas of unified airway hypothesis, upper airway physiology, office based rhinology, personalize medicine and outcomes research. He was the first surgeon at UBC to receive the Michael Smith Foundation Health Investigator Award and received a number of grants in support of his research. He hopes his research will help patients in the management of chronic sinus disease through a personalized approach.

Richard J Finley Senior Investigator Award – Dr. Christopher Honey

Dr. Honey is Professor of Neurosurgery. He obtained his medical degree from the University of Toronto and his doctoral degree from Oxford University as a Canadian Rhodes Scholar. He completed his Royal College training in neurosurgery in Vancouver in 1995 and became a diplomat of the American Board of Neurological Surgeons in 2000. He has completed an additional year of training at Harvard Medical School and is a Scholar in Surgical Leadership. His research is focused on the treatment of movement disorders and pain. He headed the world's first trial of DBS for spasmodic dysphonia and will publish the results in 2020. He was the first physician to recognize and successfully treat hemi-laryngopharyngeal spasm (HeLPS syndrome) in 2014. He discovered and successfully treated the first person in the world with VANCOUVER syndrome in 2019. He has made fundamental changes to the understanding of human pain pathways. In 2016, Dr. Honey was elected the President of the Canadian Neuromodulation Society (2016-2019) and hosted the annual national meetings in Whistler (2018) and Iqaluit (2019). The Iqaluit meeting brought attention to the fact that neuromodulation was underutilized in the Canadian North and set up referral patterns for patients in Nunavut, Northwest Territories, and Yukon. In 2018, Dr. Honey was elected President of the World Neurosurgical Federation for Cranial Nerve Disorders. This group studies conditions such as Trigemnial Neuralgia, Hemifacial Spasm, Glossopharyngeal Neuralgia and the newly described Hemi-Laryngopharyngeal Spasm (HeLPS) and has a major interest in Microvascular Decompression (MVD) neurosurgery. He has a strong commitment to teaching and has had the pleasure to train 23 neurosurgeons from around the world during their one-year fellowship with him in Vancouver. He has provided pro bono, humanitarian surgical care in Liberia (performing the first successful brain tumor removal, the first spine operation, and the first pediatric shunt) and in Ghana. He has been invited to operate in China, Indonesia, and performed the first DBS in Kuwait.

Accepted Abstracts

Click on Abstract ID to jump to the abstract.

ID	Division	Submitting Author	Title
101	Otolaryngology	Chan, Teffran Joey	Computed Tomography Study: Characterizing the Trajectory to Olfactory Cleft
104	Otolaryngology	Yong, Michael	Cost-effectiveness analysis comparing dupilumab and aspirin desensitization therapy for Chronic Rhinosinusitis with Nasal Polyposis in Aspirin Exacerbated Respiratory Disease
105	Pediatric Surgery	Choi, Seungwon	Urine Sodium to Urine Creatinine Ratio as a Marker of Total Body Sodium in Infants with Intestinal Failure
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Title: Computed Tomography Study: Characterizing the Trajectory to Olfactory Cleft
Authors: Teffran Chan, Melissa Lee, Andrew Thamboo
Affiliations: Department of Surgery, Division of Otolaryngology – Head and Neck Surgery
Introduction: Direct application of topical medication to the olfactory cleft is challenging due to narrow passage and frequent obstruction. Treatment efficacy is dependent on application of medication to affected mucosa, which is achieved through an appropriate drug applicator. To our knowledge, the trajectory of naris to olfactory cleft (OC) has not been well quantified.
Objective: We aim to study the relationship and space of middle turbinate, septum, anterior nasal spine (ANS) and cribriform plate (CP) to improve topical medication delivery and innovate potential future drug applicators.
Methods: One hundred patients (50 male, 50 female) over age of 18 were consecutively recruited from patients requiring CT imaging. Subjects with radiographic sinonasal pathology, previous surgery, or specific variant nasal anatomy were excluded. Scans were independently reviewed by two blinded authors.
Bilateral measurements of 100 selected patients were conducted in tandem by two blinded authors on boney landmarks. Statistical analysis was completed with SPSS. Inter-rater reliability was analyzed with intraclass correlation. Independent t-test and Cohen's d coefficient were used to assess significant difference between sex and effective size, respectively, with a 95% confidence interval and point of significance established at p = 0.05.
Conclusions: Patients had an average age of 46.2 (σ=14.1). Average distance from ANS to OC was 52.3mm (σ=4.2mm), average length of CP was 18.8mm (σ=3.8) with an angle relative to hard palate averaging – 8.8 degrees below parallel (σ=5.5 degree). Width of OC at anterior and posterior edges of CP were 2.3mm (σ=0.7 mm) and 2.0mm (σ=0.7 mm) respectively. Estimated average surface area of CP is 40.5 mm^2.
Men were found to have significantly greater distances from ANS to anterior CP (p <0.001, Cohen's d - 1.055) as well as greater distances from ANS to anterior point of MT (p <0.001, Cohen's d -0.9). Female were found to have significantly greater length of CP (p=0.034 , Cohen's d 0.213) as well as average width of CP (p=0.029, Cohen's d 0.219), albeit, with small Cohen's d effect size.
Findings suggest a 52.3mm gross total average trajectory from naris to reach the anterior border of the CP. However, men were found to have 4.1mm greater distance when compared to female. Gross total average width of MT was found to be 3.2 mm. Narrowest recorded width along the trajectory was 0.4 mm, suggesting devices narrower than this could potentiate direct access for drug delivery.
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Title: Cost-effectiveness analysis comparing dupilumab and aspirin desensitization therapy for Chronic Rhinosinusitis with Nasal Polyposis in Aspirin Exacerbated Respiratory Disease
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Background: Chronic rhinosinusitis with nasal polyposis (CRSwNP) in the setting of aspirin-exacerbated respiratory disease (AERD) is a disease that is difficult to treat and prone to recurrence. Dupilumab is a promising treatment for these patients, but its cost-effectiveness has not yet been compared with aspirin (ASA) desensitization, a known and effective treatment. Objective To compare the cost-effectiveness of ASA desensitization to dupilumab therapy for the treatment of CRSwNP in AERD.
Methods: Cost-effectiveness, measured in Quality-Adjusted Life Years (QALYs), and cost-utility, measured in number of required revision endoscopic sinus surgeries (ESS), analyses were conducted. Results ASA desensitization following ESS was cost-effective and dominated appropriate medical management. Adding salvage dupilumab was also cost-effective (ICER $135,517.33), and upfront dupilumab therapy was not cost-effective in any scenario (ICER $273,181.32). The costutility analysis demonstrated that over a 10-year period per patient, appropriate medical management following ESS cost $54,125.31 and resulted in 2.25 revision ESS, ASA desensitization following ESS cost $53,775.15 and resulted in 2.02 revision ESS, ASA desensitization with salvage dupilumab cost $121,176.25 and resulted in 1.68 revision ESS, and upfront dupilumab cost $185,950.34 and resulted in 1.51 revision ESS.
Conclusions: Dupilumab for the treatment of severe CRSwNP was found to be cost-effective as salvage therapy under the willingness-to-pay threshold of $150,000 USD. Further analysis highlights that the cost-effectiveness of dupilumab was most sensitive to drug price and expected quality of life gains. This suggests that additional investigation into improving patient population selection and tailoring treatment algorithms may improve the cost-effectiveness of dupilumab in specific scenarios.
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Title: Urine Sodium to Urine Creatinine Ratio as a Marker of Total Body Sodium in Infants with Intestinal Failure
Authors: Seungwon Choi[1], Linda Casey[2], Susan Albersheim[3], Rhonda Van Oerle[3], Michael A. Irvine[4,5], Hannah G. Piper[6]
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Background: Urine sodium (UNa) is a measure of total body sodium in infants with intestinal failure (IF) but can be misleading as it does not reflect volume status. Urine sodium to urine creatinine ratio (UNa:UCr) may offer a more accurate measure but is not routinely used as it has not been validated in this population.
Objectives: The purpose of this study is to evaluate the use of UNa:UCr compared to UNa in infants with IF and determine the correlation to sodium intake and growth.

Methods: A retrospective review of infants with IF, from a single center, from 2018-2020 was conducted (REB H20-00816). IF etiology, intestinal anatomy, nutritional intake, urine electrolytes and anthropometrics were collected. Linear mixed effects models adjusting for repeated measures were used to associate UNa and UNa:UCr with weight gain and sodium intake.
Results: Twenty-two infants with a median gestational age of 31 weeks were included. IF etiology included gastroschisis (41%), necrotizing enterocolitis (23%), and intestinal perforation (14%). Infants had an average of 3 paired UNa and UNa:UCr measures for a total of 74 paired measurements. UNa:UCr more strongly correlated with sodium intake compared to UNa (R=0.25, p=0.032 vs. R=0.10, p=0.38).
Overall, neither UNa (p=0.21) nor UNa:UCr (p=0.16) were significantly correlated with weight gain. However, for infants receiving ≤50% nutrition enterally, weight gain correlated with UNa (p=0.01) and UNa:UCr (p=0.01). UNa:UCr >35 predicted adequate growth regardless of enteral intake (92% sensitivity, 59% specificity).
Conclusion: UNa:UCr is a measure of total body sodium that correlates with sodium intake in infants with IF. Our study indicates UNa:UCr >35 is associated with adequate growth and can be used to guide further validation studies.
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Title: In-office vocal fold injections for glottic insufficiency: do patients regret these procedures?
Authors: Alice Q Liu[1], MD, Yunqi Ji[2], PhD, Amanda Hu[1], MD, FRCSC
Affiliations: [1] Division of Otolaryngology-Head and Neck Surgery, University of British Columbia, Vancouver, BC, Canada
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Background: In-office vocal fold injections (VFI) are an effective treatment for glottic insufficiency. While they have high completion rates with minimal complications and improve voice outcomes, there is a paucity of research on patients' decision-making process with this treatment option.
Objective: The primary objective of this study was to assess if patients reported decisional regret after VFI. Secondary objectives included determining if variables were associated with lower decisional regret.
Methods: Cross-sectional study of patients who underwent in-office VFIs from August 2017 - December 2019 at a tertiary clinic. Participants completed the validated Decision Regret Scale (DRS). Demographic data, clinician's perceptual analysis with GRBAS (Grade, Roughness, Breathiness, Asthenia, Strain), and patient's self-reported Voice Handicap Index-10 (VHI-10) were analyzed. Nonparametric tests as well as univariate and multiple logistics regression were performed.
Conclusions: Of patients eligible, 75% (136/182) completed the DRS (mean age 65.4 years (SD 13.9), 58.1% male). The vast majority reported no (61.0%) or mild (24.3%) decisional regret. Univariate analysis demonstrated that improvement in most recent VHI-10 (Kendall correlation coefficient tau=0.16, p = 0.014), Grade of voice (tau=0.24, p value < 0.001) and Breathiness (tau=0.15, p=0.022) were associated with lower DRS. Multivariate logistics regression showed that change in Grade of voice (OR 9.9, p<0.01), Roughness (OR 0.2, p<0.01) and Breathiness (OR 0.2, p<0.03) were significantly associated with DRS. Both patient endorsement of less vocal handicap and clinician-noted improvements in perceptual analysis of voice after VFI were associated with significantly lower decisional regret.
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Title: Patient outcomes in metastatic Ewing sarcoma restricted to pulmonary metastases treated with whole lung radiation
Authors: Alexa Dang[1,2], Xiaolan Feng[3], Jeremy Hamm[4], Caroline Holloway[5], Pauline Truong[5]
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Background: There is limited research on outcomes of patients with metastatic Ewing sarcoma limited to pulmonary metastases who receive whole lung radiation (WLRT). Previous studies have shown patients with metastasis restricted to lungs have better event free and overall survival compared to those with other sites of metastases.
Objective: The purpose of this study is to document provincial practices within British Columbia and outcomes of patients who received whole lung radiation for metastatic Ewing sarcoma restricted to lung metastases and compare them to available published data.
Methods: Patients of all ages with metastatic Ewing sarcoma restricted to lung treated at the BC Cancer Agency (BCCA) from 1995 to 2017 were identified from the Sarcoma Outcomes Unit (SARCOU). Patient demographic, tumor and treatment information was obtained from the SARCOU database. The subset of patients who received whole lung radiation for lung metastases was the focus of this study. Descriptive analysis was used to analyze patient, tumor and treatment factors and outcomes evaluated by regression analysis.
Conclusions: Thirty patients were included in the cohort with the following characteristics: median age of 21.7 (range 4-86), gender (60% female, 40% male), primary disease site (27% axial skeleton, 53%
appendicular skeleton, 20% visceral), diagnosis of lung metastases (46% pathological, 54% clinical), 85% of patients having more than one lung metastases, patients receiving WLRT (n=15) and no WLRT (n=15). Comparison of characteristics between the WLRT and no WLRT groups showed gender (60% female, 40% male for both), age at diagnosis (18 vs 25), primary disease site (93% skeletal, 7% visceral vs 67% skeletal, 33% visceral), diagnosis of lung metastases (46% pathological, 53% clinical for both), number of lung metastases (7% solitary, 93% more than 2 vs 21% solitary, 79% more than 2), largest lung metastases (1 cm vs 2.4 cm). Median survival follow up time was 6.8 years and PFS follow up time 6.2 years. The median dose and fractionation for WLRT was 1500 cGy in 10 fractions.
For patients who received WLRT for lung metastases, 6.67% had complete response, 53.3% partial response and 40% disease progression. The five-year progression free survival (PFS) was 86% vs 59% (p=0.33) and five-year overall survival (OS) of 78% and 54% (p=0.24) respectively for patients with WLRT vs not.
Our results show a tendency for increased PFS and OS at 5 years for patients who received WLRT although not statistically significant.
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Title: Surgical and patient reported outcomes with osteocutaneous head and neck free tissue transfers

Authors: Alice Q Liu, MD[1], Emily C Deane, MD, MSc[1], Austin Heffernan, BMSc,[2] Yunqi Ji, PhD[3], Donald W Anderson, MD, FRCSC[1], J Scott Durham, MD, FRCSC[1], Eitan Prisman, MD, FRCSC[1]
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Background: Fibula free flaps (FFF) and scapula free flaps (SFF) are commonly harvested for head and neck reconstructions. Both have suitable pedicle lengths, good bony contour match, and are amenable to dental rehabilitation. However, there are numerous considerations for each free flap, such as donor site morbidity, ambulation concerns, or patient suitability.
Objective: Primary goal of this study was to compare surgical outcomes, perioperative morbidity, decisional regret, and function of FFFs and SFFs in head and neck osteocutaneous reconstructions. Secondary objectives included examining if any variables were associated with increased perioperative morbidity, decisional regret, or function.
Methods: Case series of patients between January 2017 – Decemeber 2020 who underwent a FFF or SFF. Demographic and surgical outcome measures such as age, Charlson Comorbidity Index (CCI), anesthetic time, donor site morbidity, Perioperative Morbidity Score, and other variables were extracted. The Decision Regret Scale (DRS), University of Washington Quality of Life (UW-QoL), Oral Health Impact-14, and limb specific functional outcome measures were completed by patients.
Two-sample t-test for continuous variables or Chi-square test for categorical variables were used to compare osteocutaneous outcomes. A univariate regression and linear regression analysis were performed to identify significant variables.
Conclusions: SFF for reconstructions of the oral cavity have less early perioperative morbidity, but longer operative times ($P < 0.05$). Our SFF patients tended to be older and had less decisional regret when adjusted for ASA and CCI ($P < 0.05$). Univariate regression showed higher CCIs and presence of tracheostomy were associated with more decisional regret ($P < 0.05$). The FFF patients reported better postoperative physical outcomes ($P < 0.01$).
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Title: Evaluation of Aortic Tortuosity as a Negative Predictor of Abdominal Aortic Aneurysm Rupture
Authors: Sally HJ Choi[1], Masoud Hejazi[2], Srikantha A. Phani[2], York Hsiang[1]
Affiliations: [1]Division of Vascular Surgery, University of British Columbia, Vancouver, BC
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Background: Traditionally, maximal aortic diameter has been used as the key indication for the decision to repair an abdominal aortic aneurysm (AAA). Aortic tortuosity has been proposed as another consideration and literature suggests that ruptured aneurysms (rAAA) tend to be less tortuous compared with non-ruptured AAAs for the same diameter.
Objective: Our objective was to compare the degree of aortic tortuosity in patients with ruptured AAA with those who underwent elective repair using 2D CT imaging.
Methods: A retrospective review of a prospectively maintained database of patients that underwent AAA repair from Dec 2014 to Dec 2019 was undertaken. Patients with rAAA were matched to a group of elective AAA patients with the same average diameter. The degree of aortic tortuosity, defined as the maximum lateral deviation from aortic centreline on coronal views (mm), was measured on preoperative CT scans and compared between rAAA and non-rAAA patients.
Results: A total of 56 patients were included in the study. A cohort of 25 rAAA patients with a mean diameter of 8.38 cm were matched with 31 non-rAAA patients with the same mean diameter. In the rAAA group, the mean age was 74.8 years (84% males). For the control group, the mean age was 76.3 years (88%) males. The average aortic tortuosity for the rAAA and control groups were 9.6±8.0 mm and 18.0±11.2 mm, respectively ($p<0.001$, student's t-test).
Conclusions: Greater aortic tortuosity was seen in elective AAA patients compared with rAAA patients at the same aneurysm size. This suggests that aortic tortuosity may confer a reduced rupture risk. Further studies with larger cohorts are needed to study this observation.
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Title: Correlation of Pituitary Descent and Diabetes Insipidus Following Transsphenoidal Pituitary Adenoma Resection
Authors: Joshua Ma, Serge Makarenko, Peter Gooderham, Ryojo Akagami
Affiliations: Division of Neurosurgery
Background: Endoscopic transsphenoidal resection remains the gold standard for treatment of pituitary adenomas. A common complication of surgical resection is diabetes insipidus which presents as polyuria and polydipsia, and acts as a detriment to quality of life. It has been suggested that tension exerted on the pituitary stalk during resection and subsequent changes in postoperative anatomy may be associated with incidence of diabetes insipidus. In this study, we aim to quantify this correlation and characterize other surgical outcomes.
Hypothesis: We hypothesize that the rate of diabetes insipidus following transsphenoidal pituitary surgery can be correlated with the tension upon the pituitary stalk and subsequent pituitary gland descent following tumor resection.
Methods: We reviewed 356 patients who underwent endoscopic transsphenoidal resection of a pituitary adenoma between January 1, 2010 and December 31, 2020. 30 patients that developed postoperative diabetes insipidus were identified and included in the study. 30 patients who did not develop diabetes insipidus were also identified and matched by tumor size and volume. Clinical presentation, radiological studies, endocrinologic investigations, clinical outcomes, and complications were collected and analyzed.
Results: Of the patients, the majority were women (56.7%) and presented with headache (56.7%) and visual field deficit (60.0%). Mean pre-operative tumor diameter was 2.8 cm and volume was 8.67 cm^3. Radiological measurements showed that patients with diabetes insipidus had increased pituitary translation in the craniocaudal ($p = 0.0015$) and lateral dimensions ($p = 0.0168$). The average length of follow up was 53.7 months. 36.7% of patients who had diabetes insipidus recovered at an average timeline of 5.4 months. There was no significant difference in pituitary descent between patients who recovered from diabetes insipidus and those who did not.
Conclusions: We have demonstrated that descent of the normal pituitary gland during resection of a pituitary adenoma is associated with development of post-operative diabetes insipidus.
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Title: Deep Brain Stimulation of Midbrain Locomotor Circuits in the Freely Moving Pig

Stephano Chang[1], Andrea Santamaria[2], Francisco Sanchez[2], Luz Villamil[2], Pedro Pinheiro Saraiva[2], Francisco Benavides[2], Yohjans Nunez-Gomez[3], Juan Solano[3], Ioan Opris[2], James Guest[2], Brian Noga[2]

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Background: Deep brain stimulation (DBS) of the mesencephalic locomotor region (MLR) has been studied as a therapeutic target in rodent models of stroke, Parkinsonism, and spinal cord injury. Clinical DBS trials have targeted the closely related pedunculopontine nucleus in patients with Parkinson's disease as a therapy for gait dysfunction, with mixed reported outcomes. Recent studies suggest that optimizing the MLR target could improve its effectiveness.

Objective: We sought to determine if stereotaxic targeting of the pig MLR and DBS in the region were feasible to generate a large animal neuromodulation model of gait. We aimed to characterize optimal electrode positions and stimulation parameters to evoke locomotion, as well as off-target effects.

Methods: We implanted Medtronic 3389 electrodes into putative MLR structures in Yucatan micropigs to characterize the locomotor effects of acute DBS in this region, using EMG recordings, joint kinematics, and speed measurements on a manual treadmill.

Results: MLR DBS initiated and augmented locomotion in freely moving micropigs. Effective locomotor sites centered around the cuneiform nucleus and stimulation frequency controlled locomotor speed and stepping frequency. Off-target stimulation evoked defensive and aversive behaviors that precluded locomotion in the animals.

Conclusions: Pigs appear to have an MLR and can be used to model neuromodulation of this gait-promoting center. These results may provide insight to guide future clinical efforts.

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Title: Outcomes of Stereotactic Ablative Radiotherapy for Hepatic Metastases from Colorectal Carcinoma

McDermott, Ronan; Dunne, Emma; Zhao, Yizhou; Bergman, Alanah; Liu, Mitchell; Schellenberg, Devin; Ma, Roy

Purpose: Stereotactic Ablative Radiotherapy (SABR) is a recognised theraputic option for patients with inoperable oligometastatic colorectal carcinoma (CRC). Given the scarcity of prospective data on outcomes of SABR for metastatic CRC, this study aims to review SABR outcomes and determine any predictive factors of local control and survival in patients with liver metastases from CRC.

Materials and Methods: All provincial CRC liver metastases patients are referred to a single institution for SABR. A retrospective review of SABR patients between September 2011 and August 2019 was undertaken. Endpoints included local control (LC), overall survival (OS), progression-free survival (PFS) and time to restarting systemic therapy. Univariate and multivariable analyses (MVA) were performed to identify predictive factors.

Results: 48 patients were identified. The total number of tumours treated were 58. Median follow-up was 26.6 months. Local control at 1, 2 and 3 years was 92.7%, 80.0% and 61.2% respectively. Median time to local failure for all patients was 40.0 months (95% CI 31.8 – 76.1 months). Median overall survival for all patients was 31.9 months (95% CI 20.6 – 40.0 months). Overall survival at 1, 2 and 3 years was 79.2%, 61.7% and 44.9% respectively. Median time to disease progression in any site within the body was 7.1 months (95% CI 4.0 – 9.7 months). Disease free survival at 1, 2 and 3 years was 31.4%, 17.3% and 10.8% respectively. 33 patients (69%) restarted systemic therapy after completion of SABR upon disease progression. Median time to restarting chemotherapy was 11.0 months (95% CI 7.1 – 17.6 months). Systemic therapy free survival at 1, 2 and 3 years was 45.7%, 29.6% and 22.6% respectively. On MVA, inferior local control was influenced by GTV volume ≥40cm^3 (HR: 3.805, 95% CI 1.376-10.521, p=0.01) and PTV V100% BED <100Gy10 (HR 2.971, 95% CI 1.110-7.953; p=0.03). Inferior overall survival was associated with PTV volume ≥200cm^3 (HR 5.679, 95% CI 2.339-13.755; p<0.001)

Conclusions: SABR is an effective therapeutic option for selected patients with CRC liver metastases providing acceptable local control within the first two years after completion. In some cases, it may even provide patients with a delay in recommencing systemic therapy. Higher biological effective doses are required to enhance local control.

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Title: Synchrony in Head & Neck Surgery: Feasibility & Outcomes of Simultaneous Scapular Free Flap Reconstruction

Authors: Emily C. Deane[1], MD; Alice Q. Liu[1], MD; Sally Nguyen[1], MD, FRCSC; Donald W. Anderson[1], MD, FRCSC; J. Scott Durham[1], MD, FRCSC; Eitan Prisman[1], MD, FRCSC

Affiliations: 1. Division of Otolaryngology Head & Neck Surgery, University of British Columbia, Vancouver, Canada

Background: The scapula free flap is a versatile option in head and neck reconstruction but is less amenable to simultaneous harvest and ablation

Objective: Compare osseous reconstructions performed utilizing simultaneous surgery to that of a sequential oncologic ablation followed by scapular harvest.

Methods: Retrospective series (2015-2021) of consecutive scapula flaps. Cases categorized as simultaneous versus sequential and compared for operative time, oncological and patient-reported outcomes.

Results: Seventy consecutive scapula free flaps were performed (n= 21 simultaneous, n=49 sequential). Mandible reconstruction was done in 51.0% and 61.9% of sequential and simultaneous cases respectively; 49.0% and 38.1% addressed bony maxillary defects. Simultaneous surgery reduced operative time by 37.9% which translated to 151 minutes (p<0.00001). There were fewer tracheostomies done in the simultaneous group (p<0.005). The rates of positive margins and free flap compromise were equivalent (n=1, 4.8% vs. n=2, 4.1%). There was no difference in patient reported outcomes.

Conclusions: This series demonstrates feasibility, efficacy, and post-operative outcomes of bony scapula reconstruction of maxillofacial defects while comparing simultaneous and sequential approaches.

Benefits of the two-team approach are highlighted including decreased operative time.

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Title: Improving Adherence to an Incorrect Surgical Count Protocol

Authors: Sophie Carr[1], Nadia Vrtacic[2], Rupinder Khotar[2], Tamara Younger[2], Trina Montemurro[3], Jock Reid[4,5], Darra Murphy[6], Camille Ciarniello[7], Adrienne Melck[4, 8]

Affiliations: [1]MD Undergraduate Program, Faculty of Medicine, University of British Columbia; 2Operating Room, St. Paul's Hospital; [3]Department of Anesthesiology, St. Paul's Hospital; [4]Department of Surgery, St. Paul's Hospital; [5]Division of Vascular Surgery, University of British Columbia; [6]Department of Radiology, University of British Columbia; [7]Department of Risk Management, Patient Safety & Patient Relations, Providence Health Care; [8]Division of General Surgery, University of British Columbia

Background: Unintended retention of foreign objects after surgery should be a 'never event'. A count is routinely performed intraoperatively to account for all items used. This process is highly regulated and effective in preventing potential harm to patients; however, count discrepancies occasionally occur. In a 2-year review of incorrect counts at St. Paul's Hospital, we discovered low compliance with our count discrepancy protocol.

Objective: This project aimed to identify reasons for protocol deviation, create a modified protocol that fosters positive perioperative team culture and upholds patient safety, and achieve > 80% adherence to the modified protocol.

Methods: A multidisciplinary working group was created to evaluate the existing surgical count protocol and identify areas for improvement. Protocol modifications were informed by data collection, literature reviews, surveys of other institutions, and input from stakeholders. Following perioperative team education, the modified count protocol was implemented in December 2019.

Results: Key changes to the protocol include performing a mandatory x-ray in the operating room and having it read by a radiologist. Post-implementation data demonstrates an improvement in protocol adherence from 41% to 87% with respect to obtaining imaging in the operating room. Additionally, 93% of incorrect count x-rays are now read by radiologists prior to reversing the anesthetic. Ongoing education and refinement of the protocol is expected to further increase adherence to all aspects of the modified protocol, minimizing patient risk as a result.

Conclusions: This project has generated greater awareness around the count process and its importance for patient safety, fostered better communication and culture among members of the surgical team, and informed the development and implementation of a modified incorrect count protocol that can be adopted by other hospitals to standardize practice and improve patient care.

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Title: Patient Selection for Adjuvant Radiotherapy in WHO Grade 2 Intracranial Meningiomas

Authors: Alexander Rebchuk[1], Armaghan Alam[2], Celine Hounjet[2], Bradley Chaharyn[3], Stephen Yip[3], Peter Gooderham[1], Serge Makarenko[1]

Affiliations: [1]Division of Neurosurgery, [2]MD Undergraduate Program, [3]Department of Pathology and Laboratory Medicine

Background: Meningiomas are the most common intracranial tumour, of which 5-20% are classified as WHO grade 2. Compared to lower grade meningiomas, these tumours recur more frequently and have worse overall survival. There is conflicting evidence whether adjuvant radiotherapy improves overall survival and local recurrence following surgical resection of grade 2 meningiomas.

Objective: To explore patient-level factors in patients receiving surgery with adjuvant radiotherapy compared to surgery alone for grade 2 meningiomas at a tertiary care university hospital.

Methods: We performed a retrospective study of all patients diagnosed with a WHO Grade 2 intracranial meningioma at our institution between July 2007 and 2020. All patients underwent initial operative resection and, at the discretion of the treating neurosurgeon and local cancer agency, select patients underwent adjuvant radiotherapy. Between group differences in demographics, clinical presentation, extent of resection and tumour location were explored.

Results: A total of 191 patients were included in the study, of which 19 (9.9%) received adjuvant radiotherapy after surgical resection. Mean age was 57.5±14.8 years, 123 patients (64.4%) were female and mean Karnofsky Performance Scale (KPS) on presentation was 71±18. There were no differences in age, sex or KPS between groups. Tumour location significantly varied between groups, p=0.02. Patients receiving adjuvant radiotherapy had a higher proportion of tumours located on the sphenoid ridge (47.4% v. 12.8%), and a lower proportion located at convexity (15.8% v. 35.5%) and falcine/parasagittal (15.8% v. 26.7%) locations. Subtotal resection (Simpson grade 4-5) was associated with a significantly higher likelihood of receiving adjuvant radiotherapy (OR: 6.2 [95% CIs: 2.3, 16.8], p<0.001). There were no differences in overall survival (p=0.905) or progression free survival (p=0.983) between groups.

Conclusions: At a tertiary care academic hospital, factors increasing the likelihood of undergoing adjuvant radiotherapy following surgical resection of a WHO grade 2 intracranial meningioma include subtotal resection, and deeper, more challenging to access tumour locations. To determine if adjuvant radiotherapy confers a survival or local recurrence advantage in grade 2 meningiomas, future prospective trials must control for these potentially confounding factors.

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Title: How is the randomized control trial evidence base of otolaryngology changing over time?

Authors: Graham Landells, Brendan McNeely, Austin Heffernan, Melissa Lee, Emily Deane, Desmond Nunez

Affiliations: University of British Columbia, Faculty of Medicine, Department of Surgery, Division of Otolaryngology

Background: Randomized controlled trials (RCT) are the basis of evidence-based medicine and are considered class A evidence. This study seeks to determine if the proportion of RCTs in the Otolaryngology literature is changing over time.

Objective: To evaluate the proportion of overall and country-specific RCT evidence in Otolaryngology literature.

Methods: Original research articles published from 2016-2017 in eight otolaryngology journals chosen for impact factor and national otolaryngology society affiliation were compared with those published in 2008-2012. Articles were categorized as RCT or other study type and the nationality of origin based on the address of the corresponding author. The proportion of all RCT research, Canadian origin RCT research, and national origin of articles in both cohorts were compared using a Pearson Chi-Squared test with significance set at $p < 0.05$.

Results: There was no significant inter-cohort difference in the proportion of RCTs in 2008-2012 and 2016-2017 (3.1% and 2.68% respectively). The proportion of Canadian RCT publications were similar in both cohorts (4.0% and 2.55% respectively). The proportion of

American articles increased and British and Canadian articles decreased over time; 29.0% to 45.7% ($p < 0.0001$), 7.1% to 5.4% ($p = 0.006$) and 11.7% to 7.7% ($p < 0.0001$) respectively.
Conclusions: There was no change in the proportion of RCT evidence in the Otolaryngology literature between 2008-2012 and 2016-2017. The proportion of Canadian RCT research is stable, however the overall Canadian contribution to published Otolaryngology research appears to be declining. There remains a need for more RCT evidence to support the practice of otolaryngology.
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Title: Oncoplastic Breast Reduction Complications and Patient-Reported Outcomes
Authors: Shivani Mysuria, Elaine McKevitt, Rebecca Warburton, Leo Chen, Amy Bazzarelli, Jin-Si Pao, Esta Bovill, Mabel Zhang, Urve Kuusk, Kathryn Isaac, Nancy Van Laeken, and Carol Dingee
Affiliations: Department of Surgery, University of British Columbia. Department of Surgery, Providence Breast Centre.
Background: Oncoplastic breast reduction (OBR) combines oncologic and plastic surgery principles in breast conservation. It is an appropriate option for breast cancer patients with macromastia, ptosis, or who have breast reduction as one of their treatment goals.
Objective: The objective of this study was to evaluate complications and patient-reported outcomes after OBR.
Methods: A retrospective review including all patients who received OBR from April 2009 to April 2020 was conducted with institutional and university ethics boards' approval. Data were extracted from a prospectively maintained database and surgical electronic medical records. Risk factors for any complication were evaluated by univariate logistic regression analysis. Significance level was set at $p<0.05$. Post-operative patient wellbeing and satisfaction were evaluated with the validated BREAST-Q 2.0 Questionnaire. Rasch transformed scores from 0 (worst) to 100 (best) were calculated from each scale following validated BREAST-Q conversion tables.
Conclusions: This study included 81 OBR patients. Post-surgical complications experienced by 19 patients included localized hematoma (N=3), seroma (N=4), partial nipple necrosis (N=2), limited wound dehiscence (N=6), delayed healing (N=3), and fat necrosis (N=1). No patients had surgical complications requiring hospital admission, debridement reoperation, or hematoma evacuation. The BREAST-Q questionnaire was completed post-OBR by 37 patients, who responded favourable scores for psychosocial (84.7), sexual (69.0) and physical (80.6) wellbeing, satisfaction with their breasts (83.6), radiation oncologists (88.8), surgeons (94.3), medical staff (94.2), and office staff (95.8). All breast complications were managed with local wound care and none required repeat procedures. OBR patients reported a high degree of satisfaction with their physicians, medical and office staff. Increasing ASA score and ipsilateral and contralateral specimen weight were significantly correlated with increased odds for having any complication.
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Title: Association Between Surveillance Imaging and Survival Outcomes in Small Bowel Neuroendocrine Tumors
Authors: Akie Watanabe[1], Geoff Mckendry[1], Lily Yip[1], Jonathan M. Loree[2], Heather C. Stuart[1,2]
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British Columbia Cancer Agency
Background: Despite increasing incidence, guidelines for small bowel neuroendocrine tumor (SB-NET) surveillance following resection is inconsistent.
Objective: We evaluated the impact of surveillance imaging on disease recurrence and survival outcomes in SB-NETs.
Methods: Patients with completely resected SB-NETs referred to a provincial cancer centre between 2004-2015 were reviewed and baseline characteristics recorded. Frequency and modality of imaging studies (CT, MRI, Octreotide, MIBG, 18F-FDG PET/CT) were documented. Associations between baseline characteristics, imaging frequency and disease recurrence/survival were determined using univariate Kaplan-Meier, multivariate linear regression, and Cox-regression analyses.
Results: Among 195 completely resected SB-NET patients, 31% were ≥70 years of age, 43% were female, and 80% had grade 1 disease. Patients who recurred underwent more CT and somatostatin receptor scintigraphy (SRS) than those who did not recur (CT: 1.47 +/- 0.89 vs. 1.02 +/- 0.81 scans per year, $p<0.001$; SRS: 0.39 +/- 0.46 vs. 0.16 +/- 0.18 scans per year, $p<0.001$). The highest cumulative number of scans was 214 per 100 persons in the first-year post resection but scan positivity rate was highest after 10 years (35%). Baseline characteristics were not predictive of number of scans performed per year. The median incidence of recurrence was significantly shorter in those who underwent ≥2 scans per year (56 months) compared to 1-2 (128 months) and <1 scan per year (did not reach median) ($p<0.001$). Number of scans per year was predictive of recurrence (HR 2.52, 95% CI 1.84-3.46, $p<0.001$). Neither recurrence status nor number of scans per year were predictive of overall survival.
Conclusions: Imaging modality and frequency should be considered in SB-NET surveillance to optimize patient experience and survival benefit. Less frequent imaging over a longer duration may improve the ability to capture relevant disease recurrence.
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Title: The Use of Innovative Technology in Surgical Training in Low-Resource Settings
Authors: Kayoung Heo[1], Samuel Cheng[1], Emilie Joos MD FRCSC FACS[2], Alreem Al Hinai MD FRCSC[3], Shahrzad Joharifard MD MPH FRCSC[3]
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Background: Significant disparities exist in global surgical care, due to the lack of medical equipment, geographic constraints, infrastructural challenges, affordability, and a shortage of skilled
surgeons. Despite the rapid growth of interest in global surgical care, this has not translated into an equal exchange of surgical information between high-income countries (HICs) and low-income countries (LMICs). In recent years, a greater emphasis has been placed on training local medical personnel in order to increase surgical capacity locally without relying on external resources. To maximize training

opportunities in low-resource settings, online curricular models, simulations, and immersive technologies have been developed and implemented.
Objective: This study aims to assess and summarize innovative technologies used for surgical training in low-resource settings.
Methods: We conducted a scoping study including any literature published on surgical education technologies from 2000 to 2021. Searches were performed on Medline and Embase as well as on Google, iOS and Android app stores.
Results: Of the 3896 articles from our initial search, 110 qualified for full-text review. The technologies were identified and categorized according to the following types: web-based platforms, app-based platforms, virtual and augmented reality, and simulation. The technologies were evaluated on the basis of their content, effectiveness, cost, accessibility, and barriers.
Conclusions: Virtual learning platforms are useful in surgical training as they are easily accessible, not limited by geography, continuously updated, and evaluated for effectiveness. It is essential that more open-access, free surgical training programs be developed to provide access to educational resources for surgical trainees all around the world, particularly in low-resource settings, in order to ensure sustainable development in global surgical care.
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Title: Percutaneous Proximal Axillary Artery versus Femoral Artery Access for Aortic and Peripheral Endovascular Interventions
Authors: Alexa Mordhorst[1], Tyler Yan[2], Joel Gagnon[3], Kamyar Kazemi [1,3]
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[3]Department of Surgery, Division of Vascular Surgery, Royal Columbian Hospital, New Westminster, BC, Canada
Background: Vascular access for aortic and peripheral endovascular interventions is most commonly obtained through the common femoral artery. However, alternative access sites may be preferable in instances such as absence of palpable femoral pulses, severe CFA disease, hostile groins (previous groin surgery, morbid obesity, cellulitis), or previous aortoiliac stents or grafts.
Percutaneous transaxillary access was traditionally avoided due to the artery's perceived fragility in comparison to the thicker media layer of the femoral vessel, the concern of complications involving adjacent structures such as the brachial plexus, and the anatomic understanding that the axillary artery is not compressible and therefore difficult to achieve hemostasis. However, these concerns have not demonstrated a correlation to clinical practice, and instead, there is developing interest and support for this approach.
Most axillary artery access has been investigated through transcatheter aortic valve insertion, it is currently not commonly discussed with respect to peripheral and aortic vascular interventions.
Objective: To describe the technique of ultrasound guided PAA and to evaluate the versatility and safety of this approach in endovascular interventions.
Methods: This is a single-centre retrospective review of endovascular interventions using either PAA or femoral artery access between January 2019 and February 2021. Access entry success, complications, major adverse events, and procedural details were analyzed.
Results: A total of 115 procedures were completed, with 59 PAA and 56 femoral artery accesses. Demographics were not significantly different with the exception of BMI, 27.03 kg/m² for PAA access vs.
24.70 kg/m² for femoral access (p=0.03). Access success was achieved in 58 (98.3%) and 56 (100%) of PAA and femoral accesses, respectively (p=1.000). There were no significant differences in access-site complications (13.6% vs. 7.1%, p=0.2598) nor major adverse events (10.2% vs. 8.9%, p=1.000) between the PAA and femoral groups. Overall, 140 vessels were intervened on from the PAA approach, and 114 from femoral access. There were no significant differences in the mean number of vessels intervened on per case compared to femoral access (2.37±1.10 vs. 2.02±0.90, p=0.0603). A wide range of target vessels were intervened on in both groups including subclavian artery, aorta, mesenteric and renal vessels, and all major lower extremity vessels. There were statistically significant more interventions completed on celiac (6.4% vs. 0.9% p=0.024) and superior mesenteric (5.7% vs. 0.9% p=0.0445) vessels from the PAA approach. AA cases had significantly more bilateral cases (28.8% vs. 12.5%, p=0.00394) (Table 2). PAA access had a significantly longer mean procedure time (103.2 min vs. 57.9 min, p<0.001) and fluoroscopy time (18.2 min vs. 12.9 min, p=0.024).
Conclusions: The PAA is a feasible, versatile, and safe percutaneous access option for endovascular intervention.
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Title: Lithium Related Thyroid and Parathyroid Disease: Clinical Practice Guidelines Are Needed **Authors:** Sewon Bann, Anne Nguyen, Sabrina Gill, Julia Raudzus, Daniel Holmes, Sam Wiseman **Affiliations:** Department of Surgery, Div. General Surgery
Background: Lithium is a common treatment for mood disorders and may cause hypo or hyperthyroidism, and hyperparathyroidism. Though current practice guidelines recommend a baseline TSH measurement followed by repeat TSH testing every 3-6 months for patients on lithium treatment, adherence to these guidelines is variable. Furthermore, there are currently no official guidelines for screening for lithium- associated hyperparathyroidism.
Objective: The objective of this study is to first estimate the prevalence of biochemical thyroid/parathyroid dysfunction in patients receiving lithium therapy, and second to investigate the current approach to surveillance and treatment of lithium-associated thyroid and parathyroid disorders.
Methods: Patients who have had lithium levels ordered in our hospital laboratory in British Columbia Canada between January 2012 and March 2020 were identified using the lab information system. The serum lithium levels, TSH, fT3, fT4, creatinine, eGFR, calcium (Ca) and/or ionized calcium (iCa), and PTH levels of patients, as well as the identity of the ordering physician, was collected. A mail-out survey was then sent to the physicians who ordered these tests in patients with abnormal results.
Results: Of 4926 patients receiving lithium, 3625 patients (74%) had their TSH levels measured, of which 27% were abnormal. A total of 2957 (60%) had calcium levels measured, of which 7.5% had hypercalcemia. Ninety-six (1.9%) patients had PTH levels measured, and 41% had elevated PTH (mean PTH 22.3 (CI 9.72) pmol/L). Of 86 patients who had both PTH and Ca values, five had high PTH and Ca. Two hundred and ninety-four surveys were sent to 216 physicians. The survey response rate was 31.6%, with 12 surveys completed by nine

physicians and 65 opting out. Five physicians routinely monitored TSH and four physicians routinely monitored PTH. Only two physicians monitored both.

Conclusions: Overall, our study found a high biochemical prevalence of hypercalcemia and abnormal TSH levels in patients receiving lithium therapy. There were insufficient survey responses to comment on current screening practices by BC physicians for lithium-associated thyroid and parathyroid disorders. These observations suggest a need for establishing screening and treatment practice guidelines in this unique at-risk patient subpopulation.

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Title: Cancer Risk Estimation Using ACR Thyroid Imaging Reporting and Data System (TIRADS) in Cytologically Indeterminate Thyroid Nodules

Authors: Matthew Dickey, Anne Nguyen, Sam M. Wiseman

Affiliations: UBC Medicine, Canada

Introduction: Fine needle aspiration biopsy using The Bethesda System for Reporting Thyroid Cytopathology is the gold standard for diagnosis of thyroid nodules. However, up to 25% of these biopsies have indeterminate cytology. Currently there is no consensus on the management of these nodules.

Objective: We sought to determine if using the ACR TIRADS ultrasound score combined with the Bethesda score can help augment their thyroid cancer risk estimation.

Methods: TIRADS and Bethesda scores were collected from patients in our health centre who had undergone total thyroidectomy or lobectomy. Data from 158 patients with both scores was analyzed by multivariable regression analysis and observed for whether the pathology was benign or malignant. A similar regression analysis was also done on the same cohort using only their Bethesda scores.

Conclusions: The regression analysis model shows that as the TIRADS score increases, the odds of malignancy increase as well. The predictive value of the odds of malignancy in a thyroid nodule using both Bethesda and TIRADS together is more accurate than the odds given using the Bethesda system alone. Our model shows that the ACR TIRADS score may augment preoperative decision making for patients with cytologically indeterminate thyroid nodules when combined with the Bethesda score. If a nodule biopsy is classified as Bethesda III, IV or V, using the TIRADS score may help the physician decide between a repeat biopsy and surgery. This model can be adopted by other health sites and used as a tool to better stratify the thyroid cancer risk specific to their population.

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Title: Synoptic Reporting in Rectal Cancer Surgery

Authors: Kloos, Nicole, Chen, Leo, Karimuddin, Ahmer, Raval, Minoj, Phang, (Paul) Terry, Brown, Carl

Affiliations: UBC General Surgery

Background: Operative reports provide vital documentation of surgical procedures. However, crucial data is often missing or communicated in an obscure manner. Synoptic reporting is a clinical documentation method where critical operative information is prescriptively structured. The Commission on Cancer has introduced synoptic operative reports (SOR) for rectal cancer as an accreditation standard.

Objective: The objective of this study is to assess the impact of SORs on the completeness of reporting of critical operative data in rectal cancer and the ease of access to this data.

Methods: Three colorectal surgeons from St. Paul's Hospital developed a synoptic operative template which included 14 elements in 2007. In 2009, a Delphi process involving rectal cancer physicians was used to validate the current template; the process identified five additional elements, forming an updated synoptic template (uSOR) template. Two time periods of operative reports were examined: rectal cancer operative reports done between January 2007 – June 2009, and a second cohort after adoption of the uSOR spanning January 2016 – June 2018.

As synoptic reports were not mandated in these periods, analysis of adoption of the SOR and uSOR in each cohort was performed. As the uSOR included additional elements, we also compared the completeness of operative element reporting in three groups: traditional narrative operative reports (NOR), SORs and uSORs. Linear regression was used to evaluate differences in mean scores in the number of elements present between NORs, SORs, and uSORs and the time required to garner the elements from the reports.

Conclusions: Synoptic reporting in rectal cancer operations has increased over time at St. Paul's Hospital. Synoptic reports are significantly more comprehensive with data that is easier to access than reports that are solely narrative.

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Title: Inter-Observer and Intra-Observer Reliability in the Salter Classification of Avascular Necrosis of the Femoral Head in Developmental Dysplasia of the Hip

Authors: Emily K Schaeffer, PhD[1,2]; Ethan Ponton, BSc[1,3]; Wudbhav N Sankar, MD[4]; Harry KW Kim, MD[5,6]; Simon Kelley, MBChB, FRCS(Tr&Ortho)[7]; Peter J Cundy, MBBS, FRACS[8,9]; Charles T Price, MD, FAAP[10]; Nicholas MP Clarke, CHM, DM, FRCS[11,12]; John H Wedge, OC, MD, FRCSC[7]; International Hip Dysplasia (IHD) Study Group; Kishore Mulpuri, MBBS, MS(Ortho), MHSc(Epi)[1,2]

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Background: Avascular Necrosis (AVN) of the femoral head is a concerning complication that can result from treatments for developmental dysplasia of the hip (DDH). AVN can lead to degenerative osteoarthritis, persistent acetabular dysplasia, reduced function, and continuing

hip pain. The incidence of AVN reported in the DDH literature is widely varied (0%-73%). This variability may arise from lack of consensus on what constitutes true AVN in this patient population, and lack of clear criteria provided in studies reporting incidence rates.
Objective: To determine the inter- and intra-rater reliability of the radiographic diagnosis of AVN following closed reduction for developmental dysplasia of the hip.
Methods: A multi-centre, prospective database of infants diagnosed with DDH between 2010-2014 from 0-18 months of age was analyzed for patients treated by closed reduction (CR). Twelve pediatric orthopaedic surgeons completed two rounds of AVN assessments. De-identified anteroposterior radiographs at most recent follow-up were provided to surgeons along with patient age at radiographic assessment, length of follow-up, ands affected hip. Ten of twelve surgeons completed a third round of assessments where they were provided with 1-2 additional radiographs within the follow-up period.
Radiographic criteria for total AVN described by Salter (1969) were used. Surgeons rated the presence of AVN as “yes” or “no” and kappa values were calculated within and between rounds.
Conclusions: Despite using the most commonly referenced diagnostic criteria, radiographic diagnosis of AVN following CR in DDH patients demonstrated only moderate agreement across surgeons. The addition of sequential radiographs did not improve cross-observer reliability, and while substantial agreement was seen within observers, the range of intra-observer kappa values was large.
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Development and Application of Antibacterial Thermosensitive Collagen-Based Hydrogel for Treatment of Delayed Healing Wounds
Nafise Amiri[1], Sahand Ghaffari[2], Ida Hassanpour[1], Taesik Chae[3], Reza Jalili[1], Ruhangiz Taghi Kilani[1], Frank Ko[3], Dirk Lange[2], Aziz Ghahary[1]
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Introduction: Burn wound infections are a serious complication of thermal injury. Among the many factors that may limit effective wound healing in patients with complicated wounds, bacterial infection and poor cell recruitment appear as the leading causes for prolonged healing. Thus, a novel strategy that aims to prevent bacterial infection within the wound, while at the same time providing structural scaffolding that promote endogenous tissue repair, would be of great interest. As a nutritional protective barrier for the wound, we developed a thermosenstive collagen-based matrix called MeshFill (MF) that contains all nutrition required for cell growth with ability to fill up all the cavities and void areas in wounds regardless of their geometry. In the present work, we report on the development, and in vitro and in vivo testing of a new formulation of MF containing silver nanoparticles (AgNPs), which simultaneously prevent bacterial infection and promotes skin regeneration.
Our goal was to investigate whether a AgNPs loaded MF (MF/Ag) could provide enough antibacterial activity to prevent infection at the wound site without compromising the benefit of using nutritional liquid MeshFill in a rat wound healing model.
Methods: We fabricated MF/Ag formulation by loading different concentration of AgNPs in MF hydrogel. The antibacterial activity of MF/Ag formulation against *Methicillin-resistant Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* (PA) was examined in vitro. The wound healing efficacy of the formulation was evaluated in silicon ring splinted delayed wound healing model in rats. The splinted full thickness wounds were generated on the back of rats and treated with either MF or MF/Ag with different concentration of AgNPs or were bandaged with no treatment (NT) as a control. The healing process was monitored for 18 days. Clinical wound measurements and histological assessments were performed to compare different treatment regimens.
Results: The results of in vitro antibacterial study showed MF/Ag released sufficient concentration of silver which caused a marked reduction in colony forming units (CFU) of MRSA and PA as compared to MF alone. MF/Ag did not show any cytotoxicity to human fibroblast. Moreover, the result of animal study confirmed the safety and efficacy of applying different concentration of AgNPs loaded in MF without compromising the healing outcome in our rat model.
Conclusions: These findings suggest that AgNPs loaded MF would be a safe, antibacterial, nutritional, flowable hydrogel which can be used as a functional scaffold in treating delayed healing wounds.
Funding: This study was supported by Canadian Institute of Health Research (CIHR) Collaborative Health Research Project (CHRP) grant.
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The effect of breast cancer subtype on symptom improvement following palliative radiotherapy for bone metastases
Purpose: To assess the relationship between breast cancer subtypes and patient reported outcomes (PRO) following palliative radiotherapy for bone metastases.
Methods: Prospectively collected PRO for all breast cancer patients treated with palliative, bone metastasis-directed radiotherapy from 2013 to 2016 in the [state/province] of [blinded] were analyzed. The PRO questionnaire scored pain severity, level of function, and symptom frustration at baseline and at 3-4 weeks following palliative radiotherapy using a 12-point scale. The primary outcome was the rate of overall response (any improvement in score) and the secondary outcome was the rate of complete improvement in PRO (final PRO score of 0). Multivariate logistic analysis was used to compare response rates between molecular subgroup approximations of Luminal A (LumA), Luminal B (LumB), HER2-enriched (HER2) and Triple Negative (TN) as defined by grade and immunohistochemical staining.
Results: There were 376 patients who underwent 464 courses of palliative radiation for bone metastases. Subtypes included: 243 LumA, 146 LumB, 46 HER2, and 29 TN. There were 216 multifraction radiotherapy (MFRT) courses (median dose 20Gy) and 248 single fraction radiotherapy courses (median dose 8Gy). Overall response rate was 85% and CR rate was 25%. In comparison to LumA breast cancers, TN breast cancers were associated with a lower
rate of overall response (69% vs 86%, p=0.021) and a lower rate of complete response (10% vs 28.8%, p=0.045) on multivariate analyses.
Conclusion: Patients with TN breast cancer have lower rates of pain, function, and symptom frustration improvement following palliative radiation for bone metastases.
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Title: Safety and Efficacy of Three-dimensional Endoscopy in Otolaryngology Surgery: A Systematic Review
Authors: Yuxin Ban, Brendan McNeely, Neil K Chadha, Mark Felton
Affiliations: University of British Columbia, Faculty of Medicine; BC Children's Hospital, Division of Pediatric Otolaryngology-Head and Neck Surgery
Background: Three-dimensional (3D) endoscopes have been introduced to provide depth perception not previously appreciable with two-dimensional (2D) endoscopes. By improving anatomic visualization with 3D technology, the surgeon may better appreciate patient-specific anatomy, theoretically resulting in better surgeon experience and improved patient outcomes. There is a growing pool of literature supporting the use of 3D endoscopy for clinical use across different surgical specialties; however, the current literature falls short of adequately addressing the safety and efficacy of 3D endoscopy in Otolaryngology practice.
Objective: We aim to systematically evaluate the present literature comparing the surgical safety and efficacy between two-dimensional (2D) and 3D endoscopy in Otolaryngology procedures and as a training tool for novice otolaryngology surgeons.
Methods: Primary studies were identified through MEDLINE, Embase and Web of Science databases for all articles published prior to July 2020 that compared the outcomes of 2D and 3D endoscopy in Otolaryngology surgical procedures or simulations. Candidate articles were independently reviewed by two authors.
Results: A total of 16 full-text articles were included in the study. In clinical trials (n=9), there was no significant difference in performance time, intraoperative, or postoperative complications with 3D endoscopy when compared to 2D endoscopy. In simulation studies (n=7), error rate, and performance time for 3D endoscopy were lower than 2D in 67% (4/6) and 43% (3/7) of studies, respectively. When participant experience was assessed, all studies reported that subjective depth perception was markedly improved with the 3D system and 3D visualization was preferred over 2D visualization. Notably, four simulation studies reported that 3D systems were found to have a subjectively shorter learning curve for appropriate surgical technique among novice surgeons.
Conclusions: Three-dimensional endoscopy showed equivalent safety and efficacy compared to 2D endoscopy in Otolaryngology surgery. Moreover, data from simulation studies suggest that 3D endoscopy could hold a meaningful role as a training tool for novice Otolaryngology surgeons.
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Title: A call to bridge the divide in breast reconstruction research: A systematic review
Authors: Rebecca Z. Xu, Po Hsiang (Shawn) Yuan, Luke Maclean, Nawaf Al Muqaimi, Maryam Elmi, Kathryn V. Isaac
Affiliations:
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Department of Surgery, Division of Plastic Surgery, University of British Columbia, Vancouver, British Columbia, Canada
UT Texas Health San Antonio MD Anderson Cancer Center, San Antonio, TX, United States
Background: Breast reconstruction is an important component of comprehensive breast cancer care. Although reconstructive plans require multidisciplinary clinical-decision making, research in cross-discipline collaborations is often limited.
Purpose: This study aims to evaluate multidisciplinary involvement in breast reconstruction outcomes research.
Methods: A systematic review of breast reconstruction literature published from 2000 to 2019 using Ovid MEDLINE, Ovid EMBASE, and PubMed databases was conducted. English language articles published in North America or Europe with $n \geq 12$ non-pediatric patients were included. Articles concerning procedures not performed in the context of breast cancer care or articles that did not evaluate at least one outcome, diagnostic test, or risk factor were excluded. Authors' affiliations were used to define multidisciplinary involvement. Quality of research was evaluated using the level of evidence, journal impact factor (IF), and altmetrics.
Results: Of the 1679 articles screened, 784 met the stated eligibility criteria. Only half (50.6%) of these articles involved an author outside the discipline of plastic surgery. Compared to non-multidisciplinary studies, multidisciplinary studies were more likely to be designated with a higher level of evidence (I or II) ($p<0.001$), published in journals with higher IF ($p<0.05$), have higher usage ($p = 0.03$), and mentions ($p = 0.02$). There was no difference in citations, captures, and social media posts ($p>0.05$).
Conclusion: Breast reconstruction outcomes research often fails to offer author collaborations from non-plastic surgery disciplines. Multidisciplinary involvement in breast cancer care research is strongly recommended to improve the quality and impact of clinical studies in breast reconstruction.
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Title: Assessing the Feasibility and Efficacy of a Novel Powdered Scaffold for Rapid Wound Healing
Authors: Myriam Verly[1,2], Emily Mason[2,3], Sara Sheikh-Oleslami[1,2], Reza Jalili[2,4], Breshell Russ[2,5], Ruhangiz Taghi Kilani[2], Aziz Ghahary[2,4]
Organization(s): 1: Department of Medicine, University of British Columbia; 2: International Collaboration on Repair Discoveries (iCORD); 3: Department of Biomedical and Molecular Sciences, Queen's University; 4: Department of Surgery, Division of Plastic Surgery, University of British Columbia; 5: Department of Biochemistry and Microbiology, University of Victoria
Background: Limitations to wound healing scaffolds include antigenicity, poor wound integration, and precarious mechanical properties. To address these, our group previously developed a nutritional gel scaffold, proven to accelerate wound repair. Due to its gel-like properties, this scaffold requires a time-consuming reconstitution and is optimized for cavernous wounds.
Objective: This pilot study examined the feasibility of a powdered form of this scaffold to accelerate healing of full-thickness wounds, thus broadening the range of applications while providing a ready-to-use product.
Methods: Splinted full-thickness wounds were generated on the backs of 6 mice and treated with either powder, the original gel scaffold, or no treatment. Feasibility and efficacy of the powder scaffold was assessed through comparison of clinical wound measurements and histological assessments.

Results: We found that the powder scaffold was both easy to prepare and apply, while rehydrating in approximately 90 seconds within the wound bed. Furthermore, the powder scaffold was sufficient to increase epithelialization and wound closure rates compared to untreated wounds ($p < 0.05$), and required significantly fewer days to achieve complete wound closure ($p < 0.05$). Furthermore, our results suggest that application of this powder scaffold did not alter certain processes associated with healing progress, such as epidermal thickness and collagen deposition.
Conclusions: As such, this powder scaffold may provide a novel alternative to our previously developed gel scaffold by accelerating healing in full-thickness wounds, while providing an easy- to-use and patient-ready product.
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Title: Online Educational Materials for Appendectomy Patients Have Good Quality but Poor Readability
Authors: Roopal Rai, Adina Landsberg, Anne Nguyen, Sam Wiseman
Affiliations: University of British Columbia Faculty of Medicine, Department of Surgery, Saint Paul's Hospital
Background: The United States Department of Health & Human Services recommends health-related information be written at or below the sixth-grade level to ensure the public's understanding. Previous studies have reported that patient education materials are written at too high a level.
Objective: The objective of this project was to evaluate the readability level of online patient education materials regarding appendectomy and to evaluate website quality.
Methods: The Google search engine was used to identify relevant webpages. Webpages were evaluated using seven readability formulae: Flesh-Kincaid Grade Level (FKGL), Gunning Fog Index (GFI), Coleman- Liau Index (CLI), Automated Readability Index (ARI), Simple Measure of Gobbledygook (SMOG), Flesch Reading Ease (FRE), and New Dale-Chall (NDC). Two independent evaluators assessed quality using the Brief DISCERN tool.
Conclusions: 37 websites were analyzed. FKGL scores ranged from 5.4 to 12.9 (average =9.1), GFI scores ranged from 7.6 to 16.1 (average =11.8), CLI scores ranged from 7.0 to 14.0 (average =10.84), ARI scores ranged from 4.2 to 12.5 (average =8.00), SMOG scores ranged from 9.4 to 15.5 (average =11.9), FRE scores ranged from 29.7 to 74.4 (average =51.2), and NDC scores ranged from 3.5 to 7.3 (average =5.5). The average Brief DISCERN score for the webpages was 17.81, indicating good quality. Readability levels for online patient education materials for appendectomy are written at a higher level than recommended as determined by six of seven readability formulae. However, the quality is good. Authors of such materials will provide greater benefit to patients by adhering to readability and quality guidelines.
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Title: DOTATATE-PET Shows Promise for Diagnosis of Recurrent or Persistent Medullary Thyroid Cancer: A Systematic Review
Authors: Carla Pajak BScN (hons), MD, FRCSC[1], Lina Cadili BSc, MD[2], Kylie Nabata MD[2], Sam Wiseman BSc, MD, FRCSC, FACS[2,3]
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Introduction: Unfortunately, many medullary thyroid carcinoma (MTC) patients will have persistent disease, or eventually develop cancer recurrence, after surgery. For many patients their MTC may remain occult.
Objective: The objective of this study was to evaluate the efficacy of DOTATATE-PET versus FDG-PET in detecting and characterizing recurrent or persistent MTC.
Methods: Relevant studies were identified by conducting searches in Embase and PubMed. Abstract and full-text screening, data extraction and quality assessment were independently conducted by two reviewers. Odds ratio, mean differences and 95% confidence intervals were calculated using RevMan 5.3.
Results: Five studies investigated the per-patient sensitivity of F-FDG PET and Ga-DOTATE. The pooled per-patient sensitivity was 20.68 [1.10, 40.27], I^2=62%. Four studies investigated the correlation (ρ) between calcitonin and number of lesions detected by F-FDG and Ga-DOTATE. The ρ ranged 0.1785 to 0.5397 for F-FDG and 0.1376 and 0.6606 for Ga-DOTATE. Three studies investigated the correlation between CEA and number of lesions detected by F-FDG and Ga-DOTATE, the ρ ranged from 0.0714 to 0.6739 for F-FDG and 0.1030 and 0.5970 for Ga-DOTATE. There was no significant difference in the correlation of calcitonin or CEA and number of lesions detected by either F-FDG or Ga-DOTATE.
Conclusions: While neither DOTATATE-PET nor FDG-PET were clearly superior, a non-significant trend towards DOTATATE-PET was observed for patients with an elevated CEA level. DOTATATE-PET shows promise and warrants further study to determine its impact on MTC patient management and outcomes.
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Title: A Cost-Utility Study of Lateral Internal Sphincterotomy for the Treatment of Anal Fissures
Authors: Dr. Ahmer Karimuddin[1,2], Carmela Melina Albanese[3], Dr Guiping Liu[3], Dr Trafford Crump[3,4], Dr Khalil Merali[1], Dr Jason Sutherland[3,5]
Affiliations: 1: Department of Surgery, University of British Columbia; 2: Division of Colorectal Surgery, Providence Health Care; 3: School of Population and Public Health, University of British Columbia; 4: Department of Surgery, University of Calgary; 5: Centre for Health Services and Policy Research, University of British Columbia
Background: When conservative treatment fails, lateral internal sphincterotomy (LIS) is the standard for treating painful anal fissures. The financial cost versus patients' gain in health owing LIS are unknown and represent an opportunity to better understand the cost-utility of this elective procedure.
Objective: To measure gain in patients' health and report the cost-utility of LIS among a cohort of patients.

Methods: Data were collected from a cohort of participants, including demographics, resource utilization and patient-reported outcomes. The EQ-5D(3L) was completed by patients preoperatively and six months postoperatively. Quality adjusted life years (QALY) attributable to LIS were calculated using participant's health states utility values reported preoperatively and postoperatively. The cost per QALY was calculated as the quotient of the surgery's cost and the patient's gain in health.
Results: The cohort included 75 participants. Assuming gains in health accrue for 25 years, the mean gain in cost per QALY was 2.43 and the cost-per QALY was $1122. On average, men gained more than women, the oldest gained the least and the multi-morbid had the highest cost.
Conclusion: The cost per QALY of LIS for anal fissures is low compared to common benchmarks and relative to other surgical interventions. Although LIS is often reserved for patients with fissures refractory to medical management, this study shows significant quality of life benefit for this procedure with a low overall cost per QALY in appropriately risk stratified patients.
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Title: Long term outcomes of young patients with locally advanced, well-differentiated thyroid cancer
Authors: Daegan Sit MD[1,2,3], Aria Shokoohi BSc[2], Wan Xian Koh BSc[3], Tyler Raycraft BSc[3], Mitchell Vu MD[3], Nicole Chau[2,3], Matthew Chan[1,2], Eric Tran[1,2], Eric Berthelet MD[1,2], Jonn Wu MD[1,2], Robert Olson MD[1,5,6], Sarah Nicole Hamilton MD[1,2]
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Background: Locally advanced, well-differentiated thyroid cancer (WDTC) with invasion into major structures are categorized as pT4 by the American Joint Committee on Cancer (AJCC) 8th edition staging system. However, patients diagnosed at age <55 years are still considered to have just Stage I disease.
Objective: The objective of this study was to describe the outcomes and prognostic factors of this uncommon patient population.
Methods: Electronic records of all patients with pT4 well-differentiated thyroid carcinoma diagnosed at age 54 years or younger, treated in the province of British Columbia from 1985 to 2013 were extracted. The primary endpoints of interest were cumulative incidence of locoregional recurrence (LRR), cause- specific survival (CSS) and overall survival (OS). A competing risk analysis using Fine-Grays test was used for analysis of LRR and CSS. Cox-proportional hazards model was used for analyzing OS. Multivariate analyses were conducted. A two-sided P value ≤0.05 was considered significant.
Results: A total of 218 patients were identified, of which 137 were under the age of 45. The median follow up time was 18.2 years. All patients underwent thyroidectomy, 88% of patients received radioactive iodine, and 43% of patients received external-beam radiotherapy (EBRT). The most common prescriptions were 50Gy in 25 fractions and 60Gy in 30 fractions. The 10-year and 15-year LRR for the cohort was 17% and 21%. On multivariate analysis, there was a trend towards lower locoregional recurrence with EBRT receipt (HR: 0.47, p=0.06). Among patients who did not undergo adjuvant EBRT and had a LRR (n=19), seven had persistent disease after salvage treatments, and only two ultimately succumbed to WDTC. The 10-year and 15-year CSS was 97% and 96%. For patients diagnosed at <45 and ≥45 years, the 10-year CSS was 99% and 93% (p=0.005). There were four deaths secondary to locoregional disease and seven deaths secondary to distant disease. There were 11 distant metastases in the entire cohort. For the seven patients that died from their distant disease, the median time from distant metastasis to death from WDTC was 3.2 years. Advanced age, higher T stage, larger tumour size, and presence of LVI were associated with worse CSS (all p<0.05). The 10-year and 15-year OS was 96% and 93%. Older age, tumour size, and lymphovascular invasion were significantly associated with worse OS (all p<0.05). On multivariate analysis, EBRT receipt was not associated with improved CSS or OS.
Conclusion: Patients with non-metastatic pT4 WDTC, but aged <55 years at diagnosis, have favorable long-term survival outcomes. Adjuvant EBRT in this patient population is of uncertain benefit and should be considered carefully.
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Title: Resistance Measurements of Coronary Capillaries
Authors: Daniel Goubran, Sam Lichtenstein, Dana Grecov, Rafik Goubran, Julien Larivière-Chartier, James Abel
Affiliations: University of British Columbia – Division of Cardiac Surgery, Carleton University.
Background: The current gold standard for determining the amount of blood flow in the coronary arteries of the heart is coronary angiography. This involves injecting contrast dye in the coronary arteries and visualizing the blood flow. Areas of narrowing are identified and deemed to limit blood flow based on the degree of vessel narrowing. This method only provides a visual estimate of the limitation in blood flow but is unable to provide a quantitative measure of the amount of blood flow in each vessel. As part of a larger project, our group is trying to develop a computational fluid dynamic model that could quantify the amount of blood flow in each coronary vessel based on coronary angiography imaging. A major limitation in creating this computational model is that resistance in the capillary beds in largely unknown. Capillary resistance varies with different states of vasodilation and contractility.
Obtaining the resistance of coronary capillaries in live humans by non-invasive means has previously been challenging with limited accuracy due to dangers associated with manipulations and disruptions of coronary blood flow. Measurements on most cadaveric hearts would not result in a valuable measure since capillaries collapse within an hour of cardiac arrest.
Objective: This project aims to quantify the resistance in coronary capillaries. This is done by invasive yet accurate measurements done on cadaveric hearts within one hour of cardiac arrest. It is expected that coronary capillary resistance will be different for patients of different coronary anatomies, age and comorbidities. Therefore, we aim to create a library of capillary resistances for various patient characteristics that can be used to quantify blood flow in a computational fluid dynamic model of coronary arteries.

Methods: The most accurate method we have determined to obtain the resistance in coronary capillaries is to obtain invasive measurements on cadaveric hearts within an hour of cardiac arrest. This is achieved by working with BC Transplant and using hearts from organ donors. The hearts used for these experiments are ones that have not been accepted for transplantation. We narrowed down the inclusion criteria to patients who are donating their lungs but not their heart given that the lung retrieval surgery required retrieval surgeons to remove the heart from the body to have access to the lungs. Our team was able to create a custom experimental setup capable of flowing fluid down a coronary vessel at different flow rates and measuring the resulting resistance to flow. This setup was tested in cadaveric porcine hearts and proved capable of providing a function for the capillary resistance as a function of inflow rate for various coronary vessels. Since then, we have obtained research ethics approval as well as approval from BC Transplant and institutional approval from most health authorities in BC. Our project has now just started the phase of obtaining measurements from human hearts.
Conclusions: Accurate measurements of coronary capillary resistance are the missing link to being able to create a computational fluid dynamic model of coronary flow which could assist clinicians in planning revascularization procedures. Our team has devised an experimental setup capable of obtaining these measurements and human trials using cadaveric hearts from organ donation procedures is underway.
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Title: Superiority of Non-opioid Postoperative Pain Management After Thyroid and Parathyroid Operations: A Systematic Review and Meta-analysis
Authors: Kylie Nabata, Rachel Guo, Anne Nguyen, Jill Osborn, Sam M. Wiseman
Affiliations: General Surgery, UBC
Background: Adequate pain control is crucial for successful recovery after thyroid and parathyroid surgery. Effective postoperative pain control can shorten hospital stay, improve postoperative outcomes, decrease morbidity and improve the overall patient experience. Traditionally, opioids have been the mainstay of postoperative analgesia after thyroid and parathyroid surgeries. However, the use of opioids has been linked to an increased incidence of postoperative complications such as ventilatory depression, sedation, and postoperative nausea and vomiting (PONV), which can contribute to delayed discharge; as well as lead to opioid dependence.
Objective: The aim of this meta-analysis was to evaluate the body of evidence investigating the post-operative use of non-opioid analgesic drugs and techniques after thyroid and parathyroid operations.
Methods: A comprehensive systematic literature review via Medline, Embase, Web of Science and Cochrane Central Register for Controlled Trials from inception until December 26th, 2020 was conducted, followed by meta-analysis. Abstract and full-text screening, data extraction and quality assessment were independently conducted by two investigators. Odds ratios (OR), mean differences (MD) and 95% confidence intervals were calculated using RevMan 5.3.
Conclusions: Sixty-seven randomized control trials were identified from 486 unique publications screened. Pooled MD and 95% confidence interval for pain scores were higher for the control group at 24 hours postoperatively both at rest (-0.65 [-0.92, -0.37]) and with swallowing (-0.77 [-1.37, -0.16]) These differences were statistically significant. Furthermore, the pooled MD and confidence interval for postoperative analgesic requirements was lower in the intervention group (-1.38 [-1.86, -0.90]). The pooled OR for the incidence of PONV was 0.67 [0.48, 0.94], and for the incidence of hematoma was 0.69 [0.28, 1.65]. Non-opioid analgesia was found to be superior to the control group for pain control in patients undergoing thyroid and parathyroid operations with no significant difference in complications.

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Title: Quantifying Competitive Flow in Coronary Arteries
Authors: Daniel Goubran, Paul Bui, Dana Grecov, Sam Lichtenstein, Jessica Luc, Logan Atkinson, Edward Percy, Catherine Gauthier, Sorush Rokui, James Abel
University of British Columbia, Canada
Background: Coronary bypass graft surgery (CABG) is an open revascularization surgery which involves creating a new conduit which supplied blood flow to a coronary artery segment distal to a stenosis. Competitive flow in CABG is a concept that suggests that the amount of blood flow in the bypass graft becomes compromised if there is still high flow in the native coronary artery. This means that if the stenosis in the native artery is not tight enough, the flow going through the native coronary artery will decrease the maximal flow that the new bypass graft provides. The problem with having decreased flow in a bypass graft is that the lower flow leads to lower blood velocity which leads to lower shear stress of the blood passing through that conduit. Shear stress in a stream of blood is what prevents it from coagulating. The concern with competitive flow is that the resulting lower shear stress in the bypass conduit increases the likelihood of coagulation in the conduit leading to graft failure.
Objective: We aim to quantify the decrease in bypass conduit blood flow resulting from competitive flow. The purpose of quantifying this decrease in conduit flow is to determine what levels of competitive flow result in a clinically significant decrease in conduit flow which can result in graft failure.
Methods: To assess effects of competitive flow on CABG surgeries, we developed an experimental setup using cadaveric porcine hearts. The UBC cardiac surgery residents were given cadaveric porcine hearts and were asked to suture a bypass graft to the left anterior descending (LAD) artery of their porcine hearts. For conduit, they were given the right coronary artery of that specimen which had been harvested with all the branches ligated prior to the lab. Once the anastomosis was completed. The proximal segment of the LAD was transected and a cannula connected to a peristaltic pump was inserted. The proximal end of the bypass graft was the connected to a pressurized saline bag to simulate an aortic root pressure with fluid at a constant pressure supplying the new conduit. A transient time flow measurement (TTFM) flow probe was then placed on the bypass graft to measure the flow in the graft with various inflows of fluid in the native coronary vessel. Since the capillary networks of the heart had completely collapsed due to its cadaveric nature, incisions in the myocardial bed were required to allow for fluid outflow. The peristaltic pump setup was used to simulate the amount of flow that a stenosis would allow. A total occlusion would not allow for native coronary flow and was therefore simulated with no pump flow. Decreasing severities of stenosis were simulated with increasing velocities of native flow. Therefore, for this experiment, we measured the

flow in the bypass graft with the TTFM at various native coronary flow rates to simulate how the resulting flow in the native coronary artery affects the flow in the bypass graft.
Conclusions: The results of this experiment suggest that the flow reduction in bypass grafts resulting from competitive flow can be clinically significant. Our study is limited in that precise quantification could not be obtained in cadaveric hearts due to an inability to accurately model distal capillary resistance. Our next series of experiments are planned on live porcine hearts to obtain an accurate quantitative measure of the decreased in conduit flow resulting from competitive flow in coronary arteries.
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Title: Endotracheal Tube Modification Allowing for Lower Cuff Pressures
Authors: Daniel Goubran, Saud Lingawi, Madeline Crowley, Omar Tariq.
Affiliations: University of British Columbia.
Background: As part of the University of British Columbia Engineers in Scrubs program from the department of Biomedical Engineering, our research team was challenged with coming up with a solution for the clinical problem of post-intubation tracheal stenosis. Prolonged intubation is associated with the development of tracheal stenosis. This is widely believed to be a result of increased endotracheal (ET) or tracheostomy cuff pressures causing endothelial ischemia. The endothelial ischemia in the trachea results in remodeling and scaring over the following months which results tracheal stenosis at the site of the tracheal tube cuff. This complication of mechanical ventilation can result in airway obstructions requiring surgical intervention and can result in significant morbidity.
Objective: The purpose of the project is to develop a modification to endotracheal tubes that would require less pressure against the tracheal wall to decrease the risk of developing post-intubation tracheal stenosis.
Methods: A modified endotracheal tube cuff was designed using a double balloon cuff design with an outer fixed cuff and an inner cuff that expands and deflates with the respirator cycle based on the inner pressure in the ET tube. This design was believed to decrease the pressure cuff pressure on the trachea as its pressure fluctuation allows for higher pressure during the inspiratory cycle of respiration when a higher cuff pressure is required to maintain an air-seal. It would then be providing lower cuff pressures during expiration when an air-seal can be obtained with lower pressures. The result is a lower time- average pressure requirement which would theoretically lead to less tracheal endothelium ischemia and a decreased rate of post-intubation tracheal stenosis. This design was built then tested by creating a trachea analog capable of detecting the pressure that an ET tube cuff places on its surface. Bag valve mask ventilation was used along with a compliant balloon (serving as a lung analog) to determine the required cuff pressure needed to maintain an air seal for a traditional ET tube cuff vs an ET tube with the modified cuff. The modified cuff design showed a 30-40% decrease in minimal cuff pressure required to maintain a tracheal air-seal. This was under pressure control ventilation using bag valve mask ventilation with fixed lung compliance.
Conclusions: The described modified ET tube cuff designed demonstrated a 30-40% lower minimal cuff pressure required to maintain an air seal under fixed ventilation conditions. This shows potential for this modification to decreased the risk of post-intubation tracheal stenosis. Further testing with a wider change of ventilatory conditions and a wider range of analog lung models are required to ascertain if this modification will provide clinical benefit.
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Title: Biomarker Model for Predicting Type 2 Disease in Patients Diagnosed with CRS
Authors: Austin Heffernan[1], Joban Phulka[1], Andrew Thamboo[2]
Affiliations:
[1]University of British Columbia, Division of Otolaryngology – Head and Neck Surgery, (Department of Surgery), Vancouver, (British Columbia), Canada
[2]St. Paul's Hospital, Division of Otolaryngology – Head and Neck Surgery, (Department of Surgery), Vancouver, (British Columbia), Canada
Background: Chronic rhinosinusitis (CRS) is an inflammatory disease that may require biological therapy. Xolair (omalizumab) is an anti-IgE biologic medication that was recently approved by the FDA for use in CRS. An indication for biologics, including Xolair, is type 2 inflammation defined by elevated serum eosinophil or IgE levels.
Objective: To identify variables that predict elevated serum IgE and could serve as indicators for CRS biologi c treatment.
Methods: Patients ≥19 years old diagnosed with CRS who are undergoing functional endoscopic sinus surgery were included retrospectively. Demographics, past medical history, preoperative blood work, pulmonary function testing, Lund-Mackay (LM), Lund Kennedy (LK), SNOT-22, and EQ-5D scores were extracted.
Descriptive statistics and binary logistic regression analyses were conducted. Model superiority was based on Nagelkerke R2 scores, and area under the curve generated from receiver operating characteristic (ROC) curves.
Results: Sixty-five patients, average age 49.96 ± 13.59 years, were included. Sixty-one binary logistic regression models for elevated serum IgE were created. There were 3 top models, with the best model having sensitivity, specificity, positive predictive value and negative predictive values of 82.1, 69.2, 80.0, and 72.0 respectively. These performance measures were all higher than the Canadian Guideline model except for sensitivity. Serum eosinophil ≥300 cell/uL, CRSwNP and LM≥17 increased the odds of elevated IgE.
Conclusions:
IgE high type 2 inflammatory CRS can be accurately predicted by a model that includes eosinophil ≥300 cell/uL, CRSwNP, LM≥17, asthma diagnosis and SNOT22 ≥40. The addition of LM≥17, eosinophil ≥300 cell/uL and asthma diagnosis to Canadian biologic guidelines may help identify IgE high type 2 inflammatory CRS which may improve outcomes when prescribing Xolair in the future.
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Title: Paravertebral Block With A Paravertebral Catheter May Improve Outcomes After Minimally- invasive Cardiac Surgery
Authors: Monica Hsieh[1], Diane Kim[1], Richard Cook[2], Defen Peng[3], Travis Schisler[4]
Affiliations: 1: Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada; 2: Division of Cardiovascular Surgery, University of British Columbia, Vancouver, British Columbia, Canada; 3: Centre for Improved Cardiovascular Health (ICVHealth) at

CHÈOS Vancouver, British Columbia, Canada; 4: Department of Anesthesiology, Pharmacology, and Therapeutics, University of British Columbia, Vancouver General Hospital, Vancouver, British Columbia, Canada

Background: Postoperative pain after minimally-invasive cardiac surgery (MICS) remains a challenge and has been associated with worse outcomes and opioid-related complications.

Objective: This study aims to determine whether paravertebral blocks reduces narcotic consumption and enhances recovery in MICS.

Methods: Patients who underwent MICS by a single surgeon at Vancouver General Hospital were included in this retrospective review. The patients were identified according to the analgesic technique; control group with no regional anesthesia, paravertebral catheter group (PVC) group, and non-PVC group. Hospital length of stay (LOS) and postoperative opioid use were the primary outcomes used to compare the efficacy of analgesia. Secondary outcomes include extubation time, postoperative complications, perioperative deaths or strokes.

Conclusions: The average age-adjusted LOS in the PVC group was significantly lower compared to the LOS in the control and non-PVC groups (p=0.001). For postoperative opioid consumption, the PVC group had the lowest median, where the percentage of patients who did not receive any oxycodone was almost double in the PVC group (p=0.043). Median time to extubation was lower in the PVC group compared to the control group (p=0.03). The incidence of postoperative complications were comparable between the groups and there were no perioperative deaths or strokes. Regional anesthesia with a paravertebral catheter for MICS was associated with a reduction in LOS and postoperative opioid narcotic usage with a theoretically lower risk of opioid dependency, given the decreased number of patients requiring oxycodone. Postoperative outcomes in MICS may be improved with the addition of a paravertebral block.

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Title: Adult Survivors of Childhood Cancer: Views on COVID-19 and Vaccination

Authors: Andrew Prichard. Jeffrey Toy. Jonathan Loree. Nica Luminita. Fuchsia Howard. Estefania Ocampo-Zapata. Karen Goddard.

Affiliations: BC Cancer, Department of Radiation Oncology

Background: Adult childhood cancer survivors (ACCS) are at increased risk of developing late effects (LEs) because of their childhood cancer treatment, including cognitive delay, diabetes, metabolic syndrome, and organ damage. Consequently, many ACCS may be at increased risk for worse outcomes with COVID-19 infection. It is important to determine ACCS views on the COVID19 pandemic and vaccination.

Objective: We aimed to quantify the views of ACCS patients with regards to the ongoing COVID-19 pandemic and vaccination efforts, as well as their primary source of health information.

Methods: A non-validated survey was created using multi-disciplinary input. We emailed this online survey to 235 ACCS followed through the BC Cancer Late Effects and Follow-Up (LEAF) clinic who had provided informed consent to email contact, receiving 89 responses (37.9% RR) which were analyzed.

Conclusions: Of all respondents, 67% (95% CI 57.7-77.2%) believed that ACCS should be prioritized for vaccination, with 87% (76.4-93.6%) indicating they would receive a COVID19 vaccination if available. 77.5% (68.9-86.2%) and 88.8% (82.2-95.3%) believed that COVID19 was a serious health problem for themselves or others, respectively. There were significant differences in views based upon education level and complementary and alternative medicines (CAM) use. Education: 73.0% had post-secondary education (PSE); more PSE patients believed that masks (92.3% vs 80.2%) and social distancing (90.8% vs 83.3%) were effective COVID-19 prevention measures. PSE respondents were less likely to always follow Health Canada guidelines (80% vs 91.7%). PSE respondents were less likely to use social media as a major source of news (87.5% vs 80%). CAM use: 29.2% of respondents did not use alternative therapies. Patients using CAM were more likely to believe COVID19 would pose a harm to them (81.0% vs 69.2%), believed more in the effectiveness of masks (92.1% vs 80.8%) and social distancing (90.5% vs 84.6%), and more claimed to always follow Health Canada guidelines (85.7% vs 76.9%).

In conclusion, many ACCS appear to underestimate their risk from COVID19; whether patients had completed PSE or used CAM appeared to correlate with these results.

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Title: Barriers to Accessing Congenital Cardiac Surgical Care in Resource-Limited Settings

Authors: Samuel Cheng[1], Kayoung Heo[1], Emilie Joos MD FRCSC FACS[2], Alreem Al Hinai MD FRCSC[3], Shahrzad Joharifard MD MPH FRCSC[3]

Affiliations: [1] Faculty of Medicine, University of British Columbia; [2] Department of Surgery, Division of General Surgery, Vancouver General Hospital, University of British Columbia; [3] Department of Surgery, Division of Pediatric Surgery, British Columbia Children's Hospital, University of British Columbia

Background: Congenital heart disease (CHD) is the most common congenital anomaly. Given that 90% of children with CHD are born in resource-limited communities, lack of access to CHD treatment is associated with 200,000 preventable deaths every year. Unfortunately, reports on barriers to accessing CHD care are limited and typically locally focused. Thus, a more global understanding of these barriers is needed.

Objective: We performed a qualitative systematic review to establish a thorough understanding of barriers to accessing congenital cardiac surgical care in resource-limited settings.

Methods: A standard MeSH term search of the Ovid MEDLINE database was conducted from January 2000 to May 2021 to identify relevant articles. A thematic analysis was used to summarize qualitative data into a context-based framework that classified barriers into preoperative, perioperative, and postoperative.

Results: The search yielded 1517 articles, of which 77 satisfied the inclusion criteria. Notable preoperative barriers included delayed diagnosis, insufficient caregiver education, lack of finances, difficulty reaching treatment centers, sociocultural beliefs surrounding CHD, gender norms, and indigenous ethnicity. Perioperative barriers included lack of hospital resources, insufficient specialized workforce, need for prolonged hospitalization, strained physician-patient relationships, and communication difficulties due to language. Despite undergoing surgery, many patients nevertheless faced barriers postoperatively and into adulthood due to a shortage of critical care resources, inadequate caregiver counselling and postoperative patient education, lack of long-term follow-up, absence of CHD patient databases, accrued debt due to hospital bills and missed work, and disjointed transition into adult cardiac care.

Conclusions: Decreasing neonatal and childhood mortality must begin with recognizing barriers to accessing healthcare. Our systematic review identified priority challenges in accessing CHD care while developing a context-based framework that can be utilized to identify

specific obstacles faced by local communities. Lastly, we present sustainable solutions to the preoperative, perioperative, and postoperative barriers identified so that policymakers and healthcare providers can work to improve access to CHD care in resource-limited settings.

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Title: Distance to Muscularis Propria Predicts Recurrence after Transanal Endoscopic Microsurgery for T1 Rectal Cancer

Authors: John Gentles MD, Leo Chen MSc, Wei Xiong PhD FRCPC, Blair Walker MD FRCSC, Amandeep Ghuman MD MPH FRCSC, Ahmer Karimuddin MD MAEd FRCSC, Manoj Raval MD MSc FRCSC, Terence Phang MD MSc FRCSC FACS FABCRS, Carl Brown MD MSc FRCSC FACS
Affiliations: General Surgery, Pathology and Laboratory Medicine, St. Paul's Hospital, Providence Healthcare, Vancouver BC

Background: Colorectal cancer is the second leading cause of cancer death in Canada, with an increasing incidence in younger populations. Appropriate patients with early rectal cancer can benefit from organ sparing techniques including Transanal Endoscopic Microsurgery (TEM). The optimal pathologic variables that predict local recurrence after TEM have not yet been established.

Objective: The aim of this study is to determine which pathological features best predict recurrence after TEM for early rectal cancer.

Methods: All patients undergoing TEM between 2007-2017 with a final diagnosis of T1 rectal cancer were retrospectively reviewed, including a reanalysis of all pathological specimens. Those who developed recurrence were compared against those who did not. Pathologic variables were evaluated by logistic regression.

Results: 132 patients were identified during the study period. 15 recurrences were detected (11.4%) including 12 patients with locoregional recurrence and 3 with distant metastatic disease. Among those with recurrence median disease-free survival was 12 months (range 3-45 months). Distance to muscularis propria (DMP) and piecemeal excision were significantly associated with recurrence in univariate logistic regression (p=0.031 and 0.025, respectively). Other conventional pathologic markers were not associated with recurrence. DMP <0.8mm conferred a sensitivity of 77% (95%CI 0.46-0.95), specificity of 57% (95%CI 0.46-0.68), positive predictive value of 22% (95% CI 0.11-0.37) and negative predictive value of 94% (95%CI 0.83-0.99) for recurrence.

Conclusions: TEM for T1 rectal cancer has a low risk of recurrence. Distance to muscularis propria < 0.8 mm was significantly associated with disease recurrence after TEM. This novel histologic measurement may serve as an objective and prognostic variable to guide surgical and surveillance decisions after TEM for early rectal cancer.

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Title: Do Sudden Sensorineural Hearing Loss Patients with a neural pattern of hearing loss have the same recovery profile as other Sudden Sensorineural Hearing Loss patients?

Authors: Rebecca Zhang Xu BSc, Printha Wijesinghe PhD, Grace Joshua MD, Aysha Ayub BSc, Melissa Lee Bsc, Desmond Nunez MD
Affiliations: University of British Columbia, Department of Surgery, Division of Otolaryngology

Background:

Sudden Sensorineural hearing loss (SSNHL) is a condition of unknown aetiology in which the site of lesion along the axis from inner ear sensory cells to auditory nerve is undetermined. 30% or more of patients fail to recover with current treatments. In this study, audiometric findings at presentation were used to locate the site of lesion in SSNHL patients as neural or inner ear.

Hypothesis:

The null hypothesis is that neural lesion SSNHL patients are as likely to recover as inner-ear lesion SSNHL patients.

Methods:

The charts of SSNHL patients presenting to Vancouver General Hospital from November 2013 to June 2019 were retrospectively reviewed. Patient age and sex, initial and final Pure Tone Audiometrics (PTA), Word Recognition Scores, and treatment were recorded. Patients with audiometric confirmed partial or complete hearing recovery were classified as recovered. The inter-group differences in the proportion of patients with hearing recovery and pure tone audiometric gain were compared by Fisher's exact and independent samples t-test respectively using SPSS vs. 25.0.

Results:

166 charts were reviewed. 53 met inclusion criteria. 13 (mean age: 55.6±14.5) and 40 (mean age: 55.4±14.9) patients were classified as neural and inner ear, respectively. Recovery was demonstrated in 61.5% and 65.0% of neural and inner ear, respectively (p=1.0). Affected ear's mean PTA4 gain was 24.2±25.6 and 9.8±20 dB (p=0.043); mean WRS change was 45.3±28.9 and 3.0±24.5; (p=0.0003), respectively in neural and inner ear. Both were significantly different.

Conclusion:

SSNHL patients with a neural type of hearing loss demonstrate greater hearing gain after treatment than those with an inner-ear type.

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Title: Combination of Adipose Micro Fragments and MeshFill for Treatment of Delayed Wounds

Authors: Sara Sheikh-Oleslami[1,2], Ida Hassanpour[2], Nafise Amiri[2], Reza B Jalili[2,3], Ruhangiz T Kilani[2], Aziz Ghahary[2,3]
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Introduction: An intricate process, wound healing involves both cell-cell interactions and cell- matrix signaling. This process is delayed in chronic wounds by abundant inflammation, lack of matrix deposition and paucity of progenitor cells. The longer a wound remains open, the greater is the risk of infection and other complications. Commercial solid (sheet) scaffolds can be used for tissue repair and regeneration; however, these scaffolds are unable to conform to wounds of varying shapes and sizes, making these wounds more difficult to treat. To overcome this problem, we generated a liquid, injectable skin substitute known as MeshFill that can fill all the cavities and tunnels seen in deep ulcers. MeshFill also has all necessary ingredients for skin cells to be nourished, proliferate, and migrate in. Paucity of progenitor cells within chronic wounds is another important factor that hinders wound healing. As such, addition of a viable source of progenitor or stem cells to the wound bed is considered a plausible strategy to improve the healing process. Adipose tissue is a rich source of mesenchymal

stem cells; however, these cells require an extracellular matrix to survive and function normally. Here, we aim to use a combination of adipose tissue micro fragments and MeshFill to develop a composite, in situ forming skin substitute for treatment of chronic wounds.
Objective: It is our working hypothesis that development and application of combined adipose micro fragments and MeshFill will improve the healing of hard-to-treat wounds.
Methods: We first examined the *in vitro* survival and migratory capacity of adipocytes derived from rat micro-fragmented fat when cultured in MeshFill, a 3D nutritional scaffold, using a Live/Dead assay. We then examined the efficacy of MeshFill combined with adipose micro fragments (MFA) compared to MeshFill alone (MF) as well as a standard dressing protocol (NT) as a control *in vivo* using full-thickness splinted wounds in rats. The healing process was monitored for 10 days. Following wound measurements and histological analyses were performed to compare wound healing amongst groups.
Results: Cell migration *in vitro* was observed within the 3D MeshFill after 7 and 14 days. The number of red (dead) cells was negligent, indicating cell viability in the system. *In vivo*, both MFA and MF showed improved wound healing quality and improved wound epithelization compared to the NT control. No significant differences were observed between the MF and MFA groups for any outcome.
Conclusions: Our findings show that a 3D nutritional liquid skin scaffold is a rich environment for adipocyte viability and migration and that addition of adipose micro fragments to MeshFill is as effective as standard MeshFill in ameliorating wound healing. As such, adipose micro-fragments combined with MeshFill could be used both as a source of cells and as a rich scaffold for treating chronic wounds.
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Title:Oropharyngeal ultrasonography in transoral robotic surgery patients: a feasibility study
Authors: Milner TD[1], Pang E[2], Chen W[3], Zeng Qi[3], Salcudean T[3], Prisman E[1]
Affiliations:
1. Department of Otolaryngology, Vancouver General Hospital
2. Department of Radiology, Vancouver General Hospital
3. Department of Electrical and Computer Engineering, University of British Columbia
Background: Transoral robotic surgery (TORS) allows improved access to the oropharynx, yet at the expense of loss of haptic feedback. Inaccurate oropharyngeal tumour assessment, can either lead to positive margins with consequent treatment escalation, or excessive tissue resection with consequent increased morbidity. Ultrasonography of the oropharynx has undergone limited research, and its application in TORS is yet to be evaluated.
Objective: This feasibility study aims to assess the practicality of both 2D and 3D ultrasonography of the oropharynx and oropharyngeal tumours
Methods: Patients with early-stage (cT1-3, N0-2) oropharyngeal cancer planned to undergo TORS were identified prospectively, and consented for inclusion in the study. Participants underwent oropharyngeal ultrasound (Phillips EPIQ 7G with xMATRIX X6-1, C9 and C12.3 probes), to assess tumour characteristics (tumour size, distance to vessels, and structure invasion) and normal anatomy (lingual artery, genioglossus and hyoglossus muscle positions, and tonsil volumes).
Outcomes were compared to cross-sectional CT imaging and pathology.
Results: 5 oropharyngeal tumour patients have been included. Mean tumour volume as assessed by ultrasound and CT was 40.2cm^3 and 42.0cm^3 respectively. Greater tumour definition is demonstrated using US, with tumour margin evaluation challenging in CT imaging. Pathological mean tumour volume was 58.5cm^3. Evaluation of tumour distance to external carotid artery was feasible using ultrasound, identifying a mean distance of 5.3mm (CT mean distance also measured 5.3mm). Anatomical identification of lingual arteries, genioglossus and hyoglossus muscles was also feasible.
Conclusions: Oropharyngeal US provides an accurate real-time evaluation of oropharyngeal cancers, highlighting a potential role for intraoperative imaging during TORS.
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Title: Utilizing CD19 as a selection marker for scalable production of stem cell derived β-cells
Authors: Helen Huang, Francis Lynn
Organization(s): BC Children's Hospital Research Institute, Canada
Background: Type 1 diabetes (T1D) is a disease caused by the autoimmune destruction of pancreatic β cells, leading to insufficient insulin production and chronic hyperglycaemia. Cadaveric islet transplantation is an effective intervention for T1D, but this procedure is limited by the scarce supply and inconsistent quality of islet donors. Recently, stem cell-derived β-cells (SCβ-cells) emerged as a renewable, scalable and thus promising alternative for cadaveric islets. We differentiate human embryonic stem cells (hESCs) as aggregates into SCβ-cells following a 6-stage, 20-day differentiation protocol. Specifically, this protocol features a fluorescence- activated cell sorting (FACS) procedure to purify late-stage SCβ-cells. However, FACS limits the scalability of SCβ-cells production, thus limiting the transition of SCβ-cells beyond the lab and into a clinical setting. Magnetic bead-based selection of SCβ-cells expressing a unique surface marker may obviate the need for FACS. CD19 is a B lymphocyte surface protein normally not expressed on SCβ-cells, for which there are clinical-grade, bead-based selection reagents.
Objective: We explored CD19 as a potential cell surface marker for the scalable production of SCβ-cells.
Methods: Using CRISPR/Cas9 technology, we introduced a truncated form of CD19 under the insulin promotor of SCβ-cells. We purified insulin-expressing SCβ-cells using magnetic-bead- based selection of CD19. Next, we will characterize the gene expression profile and function of these purified SCβ-cells.
Results: We confirmed successful knock-in of INS-2A-CD19-mScarlet with sequencing and karyotyping. We differentiated this cell line into stage 6 CD19+/mScarlet+ SCβ-cells and optimized its dissociation protocol to facilitate gentle digestion of aggregates. We successfully enriched for CD19+ cells from a single cell suspension using anti-CD19 microbeads and the MACS® system (Miltenyi).

Conclusions: CD19 is a robust and viable selection marker for the enrichment of SCβ-cells. We expect this selection method to generate a therapeutic dose of 1 million aggregates per differentiation, which will facilitate the transition of SCβ-cell into clinical settings and will help further pancreatic β cell research.

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Title: Ischiorectal Proximal Epithelioid Sarcoma and The Utility of Three-Dimensional Imaging and Printing in Perioperative Planning, Education, and Counselling: A Case Report

Authors: Angela Yang[1], Alreem Al Hinai MD FRCSC[2], John Staples MD FRCSC[3], Trevor Hamilton MD FRCSC[4], Sima Zakani PhD[5], Shahrzad Joharifard MD MPH FRCSC[2]

Affiliations: 1 Office of Pediatric Surgical Evaluation and Innovation, BC Children's Hospital, University of British Columbia, 2 Department of Surgery, Division of Pediatric Surgery, BC Children's Hospital, University of British Columbia, 3 Department of Surgery, Division of Plastic Surgery, BC Children's Hospital, University of British Columbia, 4 Department of Surgery, Division of General Surgery, Vancouver General Hospital, University of British Columbia

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Introduction: Three-dimensional (3D) imaging and printing are increasingly recognized as useful adjuncts in preoperative planning for complex surgical procedures. Patient-specific surgical models can help surgeons better understand and visualize a patient's anatomy, disease, and surgical plan. There is limited research, however, on the utility of 3D imaging and printing in perioperative education and counselling of patients and their families, especially with respect to pediatric tumours.

Objective: The aims of our study were two-fold. First, we aimed to describe the medical and surgical management of an adolescent female with a locally-advanced ischiorectal proximal epithelioid sarcoma. Second, we aimed to investigate patient and family perspectives on the utility of 3D imaging and printing in perioperative education and counselling.

Methods: We performed literature reviews of proximal epithelioid sarcoma, the utility of 3D imaging and printing in preoperative planning for resection of pediatric tumors, and the use of 3D imaging and printing in perioperative education and counselling in pediatric surgery. Following the conclusion of adjuvant treatment, we conducted a virtual interview with the patient's parents in order to examine the impact of using a 3D model on their experience with perioperative education and counselling.

Results: Proximal epithelioid sarcoma is a rare and aggressive type of soft tissue sarcoma. This is the first case report of proximal epithelioid sarcoma in the pediatric population and one of only a handful of case reports describing the management of this type of tumour in the ischiorectal region. Our use of 3D imaging and printing assisted in the surgical planning and successful excision with negative margins of an ischiorectal sarcoma via a laparoscopic abdomino-perineal resection (APR), wide local excision, and reconstruction with vertical rectus abdominis myocutaneous flap (VRAM) flap. Finally, while literature on the use of 3D imaging and printing in perioperative education and counselling is scarce, our patient's parents found that examining the 3D model greatly enhanced their comprehension of the surgical plan.

Conclusion: We present a case report of a surgically-excised locally-advanced ischiorectal proximal epithelioid sarcoma in an adolescent female. Our experience affirms that 3D imaging and printing are helpful tools in preoperative planning for complex surgical procedures. Further, we suggest that 3D models can improve perioperative counselling and education for patients and families undergoing resection of pediatric tumours.

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Title: The impact of mentorship on learning curves in transanal endoscopic microsurgery (TEM)

Authors: Ameer Farooq[1], Nathan Lee[1], Carl Brown[1], Francois Rouleau-Fournier[1], Terry Phang[1], Ahmer Karimuddin[1], Manoj Raval[1]

Affiliations: 1- Division of Colorectal Surgery, Department of Surgery, St. Paul's Hospital, University of British Columbia, Vancouver, BC

Background: Transanal endoscopic microsurgery (TEM) has been widely adopted as an optimal technique for resection of select rectal neoplasms. TEM has technical challenges, including limited working space, narrow working channel, and reduced ability for instrument triangulation. it is unclear what the learning curve is for this technique. It is also unclear if this learning curve differs between mentored and non-mentored surgeons.

Objective: The purpose of this study to characterize the learning curve for this technique, and to characterize the differences in learning curves between fellows and attending surgeons.

Methods: Prospectively collected data from all TEM cases at our institution was reviewed as required for this study. Patient characteristics, tumor characteristics, operative details, and post-operative histology and outcomes were collected. Two unmentored surgeons, two mentored faculty surgeons, and four fellows were included. Operative time (OT) was the primary measure of proficiency. Restricted cubic spline curves were plotted to determine inflection points for OT by number of cases, and was adjusted for tumour size (cm^2), tumour location, tumour height, peritoneal breach, and tumour recurrence status. Finally, we performed a multivariate regression to examine for factors associated with longer operative time for the first 50, 100 to 150, and beyond 150 cases.

Conclusions: From March 2007 to May 2020, 945 TEM cases were performed. Mean OT was 52.4 min (+/- 30.7 min). There were low rates of bleeding (6.5%) and readmission (3.3%). Most of these procedures were for adenomas (52.2%), followed by adenocarcinomas (35.2%). Fellows on average performed 37.4 cases during fellowship. Cubic spline analysis demonstrated that two unmentored surgeons reached a plateau in OT after approximately 50 cases, with a second plateau occurring after approximately 150 cases. The highest volume surgeons appeared to reach a plateau in their learning curve after approximately 100 cases. Fellows appeared to reach a plateau in their learning curve at approximately 20 cases, although 3 out of the 5 still seemed to be improving even towards the end of their fellowship. Regression found tumor area to be the only statistically significant factor associated with longer operative time, although suture closure of the defect and higher ASA score also trended towards longer operative time.

Our retrospective review of four surgeons and four fellows is one of the largest series of reported TEM cases. Cubic spline analysis of TEM cases demonstrated that TEM is a technically challenging procedure that requires approximately 30 cases to become proficient. The number of cases to reach plateau was shorter among mentored surgeons compared to unmentored surgeons. Surgeons interested in developing a TEM program should obtain mentorship from surgeons experienced in TEM.

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Title: Long-term Analysis of Patient-reported Digital Replantation Outcomes at a Single Quaternary Trauma Center.

Authors:
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Introduction: Digit replantation is a life-altering procedure affecting function and psychosocial well-being. Literature on long-term outcomes from the patients' perspective is lacking. This retrospective study compares patients that underwent successful digit replantation with those that had an attempted replantation and later required revision amputation to determine patient-reported functional, aesthetic, psychosocial outcomes, and decision regret.
Methods: All patients who underwent digital replantation from 2000-2018 were retrospectively reviewed. Eligible patients were sent the following questionnaires: Decision Regret Scale, Disability of the Arm, Shoulder and Hand, relevant sections of the Michigan Hand Outcomes Questionnaire and Short Form 36. Categorical data were analyzed by Fisher exact test and continuous data were analyzed by the Wilcoxon rank-sum test with Cuzick extension for ordinal variables.
Results: Of 146 eligible patients, 55 responded (37.7% response rate): 34 (61.8%) had successful digit replantation (Replant Group) and 21 (38.2%) underwent revision amputation after failed replantation (RevAmp Group). Mean follow-up time was 9.9±4.7 years. Mean age, surgery time, and ischemia time did not differ between groups. The two groups did not differ for long-term function (p=0.56), emotional impairment (p=0.55) and satisfaction with aesthetic appearance (p=0.48). RevAmp patients were significantly more likely to express decision regret (p<0.01).
Conclusions: Nearly a decade following digital replantation, regardless of revision amputation status, patients report good functional outcomes, but some dissatisfaction with appearance and psychosocial states. Decision regret for undergoing replantation is greater for those who require revision amputation. These long- term outcomes should be considered when counseling patients on the decision to undergo replantation.
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Title: "When we were young": Patterns of healthcare utilization leading to diagnosis of young-onset colorectal cancer (yCRC) in a population-based cohort

Authors: Ameer Farooq, MD, MPH,[1,2], Carl J. Brown, BSc, MSc, MD, FRCSC,[1,2,3], Eric C. Sayre, PhD,[4], Manoj J. Raval, BSc, MSc, MD, FRCSC,[1,2,3], Jonathan M. Loree, MD, MS, FRCPC,[5,6], Mary A. De Vera, BSc, MSc, PhD,[3,7,8]
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Background: There is increasing risk of young-onset colorectal cancer (yCRC) in adults <50 years. We compared patterns of healthcare utilization between yCRC average-age onset (aCRC, ≥50 years) patients before diagnosis.
Objective: The purpose of this study to characterize the learning curve for this technique, and to characterize the differences in learning curves between fellows and attending surgeons.
Methods: We conducted a longitudinal study using linked administrative health databases in British Columbia, Canada. We assessed outpatient and emergency department (ED) visits and hospitalizations over a 5-year prediagnosis period (e.g., year-5 to year-1). We used Poisson regression to evaluate the association between healthcare utilization and age at CRC diagnosis, adjusting for demographic factors and comorbidities.
Conclusions: We included 2,567 patients with yCRC (50.4% females) and 32,019 with aCRC (47.3% females). In prediagnosis year-1, patients with yCRC had fewer mean outpatient visits (10.8 vs 15.2, p < 0.001) and hospitalizations (0.601 vs 0.786, p < 0.001) than aCRC, but higher mean ED visits (0.212 vs 0.165, p = 0.0054). A higher proportion of yCRC visits were for nausea and vomiting (14.9% vs 10.1%, p<0.001), abdominal pain (6.7% vs 3.0%, p<0.001), and hemorrhoids (3.2% vs 1.4%, p<0.001) compared to aCRC visits. A lower proportion of yCRC visits were for "other disorders of the intestine" (5.5% vs.
6.6%, p<0.001). Poisson regression models indicated higher expected count ratios for outpatient visits for yCRC compared to aCRC patients (adjusted count ratio 1.23; 95% CI, 1.18 to 1.28).
Our study does not indicate higher healthcare utilization among yCRC patients compared to aCRC before diagnosis. yCRC patients do not likely experience missed diagnostic opportunities on a population level in a publicly funded healthcare system.
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Title: Cardiac surgery in North America and coronavirus disease 2019: Regional variability in burden and impact

Authors: Jessica G.Y. Luc, MD,[1] Niv Ad, MD,[2] Tom C. Nguyen, MD,[3] and the COVID-19 North American Cardiac Surgery Survey Working Group
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Background: The coronavirus disease 2019 (COVID-19) pandemic has resulted in an increase in hospital resource utilization and the need to defer nonurgent cardiac surgery procedures. The present study aims to report the regional variations of North American adult cardiac surgical case volume and case mix through the first wave of the COVID-19 pandemic.
Methods: A survey was sent to recruit participating adult cardiac surgery centers in North America. Data in regard to changes in institutional and regional cardiac surgical case volume and mix were analyzed.
Results: Our study comprises 67 adult cardiac surgery institutions with diverse geographic distribution across North America, representing annualized case volumes of 60,452 in 2019. Nonurgent surgery was stopped during the month of March 2020 in the majority of centers (96%), resulting in a decline to 45% of baseline with significant regional variation. Hospitals with a high burden of hospitalized patients with COVID-19 demonstrated similar trends of decline in total volume as centers in low burden areas. As a proportion of total surgical volume, there was a relative increase of coronary artery bypass grafting surgery (high +7.2% vs low +4.2%, P = .550), extracorporeal membrane oxygenation (high +2.5% vs low 0.4%, P = .328), and heart transplantation (high +2.7% vs low 0.4%, P = .090), and decline in valvular cases (high –7.6% vs low –2.6%, P = .195).
Conclusions: The present study demonstrates the impact of COVID-19 on North American cardiac surgery institutions as well as helps associate region and COVID-19 burden with the impact on cardiac surgery volumes and case mix.
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Title: Cardiac surgeons' concerns, perceptions, and responses during the COVID-19 pandemic
Authors: Jessica G.Y. Luc, MD,[1] Niv Ad, MD,[2] Tom C. Nguyen, MD,[3] and the COVID-19 North American Cardiac Surgery Survey Working Group
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Background: The coronavirus disease 2019 (COVID-19) pandemic has had an unprecedented impact on health care and cardiac surgery. We report cardiac surgeons' concerns, perceptions, and responses during the COVID-19 pandemic.
Methods: A detailed survey was sent to recruit participating adult cardiac surgery centers in North America. Data regarding cardiac surgeons' perceptions and changes in practice were analyzed.
Results: Our study comprises 67 institutions with diverse geographic distribution across North America. Nurses were most likely to be redeployed (88%), followed by advanced care practitioners (69%), trainees (28%), and surgeons (25%). Examining surgeon concerns in regard to COVID-19, they were most worried with exposing their family to COVID-19 (81%), followed by contracting COVID-19 (68%), running out of personal protective equipment (PPE) (28%), and hospital resources (28%). In terms of PPE conservation strategies among users of N95 respirators, nearly half were recycling via decontamination with ultraviolet light (49%), followed by sterilization with heat (13%) and at home or with other modalities (13%). Reuse of N95 respirators for 1 day (22%), 1 week (21%) or 1 month (6%) was reported. There were differences in adoption of methods to conserve N95 respirators based on institutional pandemic phase and COVID-19 burden, with higher COVID-19 burden institutions more likely to resort to PPE conservation strategies.
Conclusions: The present study demonstrates the impact of COVID-19 on North American cardiac surgeons. Our study should stimulate further discussions to identify optimal solutions to improve workforce preparedness for subsequent surges, as well as facilitate the navigation of future healthcare crises.
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Title: Impact of the Coronavirus Disease 2019 Pandemic on Cardiac Surgical Education in North America
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Background: We report the impact of the coronavirus disease 2019 (COVID-19) pandemic on cardiac surgery trainee education in North America.
Methods: A survey was sent to participating academic adult cardiac surgery centers in North America. Data regarding the effect of COVID-19 on cardiac surgery training were analyzed.
Results: Responses were received from 53 academic institutions with diverse geographic distribution. Cardiac surgery trainee re-deployment to alternative clinical duties peaked at the height of the pandemic. We stratified institutions based on high (n = 20) and low burden (n = 33) of patients hospitalized with COVID-19. The majority of institutions have converted didactics (high burden 90% vs low burden 73%) and interviews for jobs/fellowships (high burden 75% vs low burden 73%) from in- person to virtual. Institutions were mixed in preference for administration of the licensing examination, with the most common preference for examinations to be held remotely on normal timeline (high burden 45% vs low burden 30%) or in person with more than 3-month delay (high burden 20% vs low burden 33%). Despite the challenges experienced during the COVID-19 pandemic on trainee clinical experience, re-deployment, and decreased operative volume, institutions expected their trainees to graduate on schedule (high burden 95% vs low burden 91%).
Conclusions: Our study demonstrates that actions taken during the COVID-19 pandemic has led to disruptions in cardiac surgery training with transition of didactics and interviews virtually and re- deployment to alternative duties. Despite this, institutions remain optimistic that their trainees will graduate on schedule.
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Title: Unified Airway Model: Comparison of the Microbiome of the Upper and Lower Airways of Chronic Rhinosinusitis and Asthma Patients
Authors: Maria Caray, Andrew Thamboo, Juan C. Hernaiz, Julia Yang, Amin R. Javer, Don Sin, Janice Leung
Affiliations: St. Paul's Sinus Centre at St. Paul's Hospital, Vancouver Canada
Background: The unified airway model posits that the upper and lower airways are intrinsically connected, functioning as one unit. This model has been supported in studies where a relationship between chronic rhinosinusitis (CRS) and asthma severity has been found. In recent years, there has been growing interest in understanding the pathophysiology of CRS inflammation pathways through microbiome interactions. Our goal is to examine the microbiome of the upper and lower airways of participants who have CRS with or without comorbid asthma.
Hypothesis: The sinus epithelium and lung epithelium derived from asthmatic or non-asthmatic participants with CRS will exhibit similar microbiomes.
Methods: Sinus epithelial cells (NEC), lung epithelial cells (LEC), nasal lavage and bronchoalveolar lavage were collected from 18 CRS participants (7 asthmatic, 9 non-asthmatic). Epithelial cells were retrieved with bronchial cytology brushes. From the epithelial cells, DNA was extracted and submitted for 16S rRNA sequencing for microbiome diversity analyses. Nasal lavage and bronchoalveolar lavage were collected through saline washes of the sinuses and lungs, respectively. From the lavages, cell pellets were isolated via centrifuge techniques, stained with Hematoxylin and Eosin and examined for inflammatory cell differentials.
Conclusions: Alpha diversity metrics (Shannon diversity index and Faith's phylogenetic diversity index) were significantly lower in LEC compared to NEC, regardless of asthma status. Beta diversity metrics showed significant overlap in microbiome community compositions between LEC and NEC. Age, type of CRS (with or without polyps), and asthma status did not impact beta diversity distributions. Taxonomy plots of normalized relative abundances for NEC and LEC showed major overlap in microorganisms present. However, *Staphylococcus spp.* and *Corynebacterium spp*. were found to be more frequent in NEC, while *Sphingomonas spp.* was found to be more abundant in LEC. Taxonomy plots of normalized abundances also showed that compared to non-asthmatics, asthmatic participants had a higher relative abundance of *Cellulomonas spp.* and lower relative abundance of *Sphingomonas spp.* in their LEC, and a lower relative abundance of *Staphylococcus spp.* in their NEC.
The results suggest that the lung epithelium and sinus epithelium exhibit similar microbiome community compositions, despite the lung epithelium exhibiting lower microbiome diversity. Optimization of lavage collection and increased sample size are needed to further support the hypothesis. The role of *Staphylococcus spp.*, *Corynebacterium spp.*, *Sphingomonas spp.* and *Cellulomonas spp*. in chronic airway inflammation should be further investigated.
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Title: Characteristics Assessment of Online YouTube Videos on Radiotherapy for Lung Cancer
Authors: Zhang Hao (Jim) Li [a], Meredith Giuliani MBBS, MEd, PhD, FRCPC [b, c], Paris-Ann Ingledew MD, FRCPC, MHPE [d, e]
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Background: The internet is a mainstay source of health information for cancer patients. However, there has been no studies examining the quality of publicly available videos on radiotherapy for lung cancer.
Objective: We aim to systematically map and objectively assess videos discussing radiotherapy for lung cancer on YouTube.
Methods: The terms "radiotherapy for lung cancer," "radiation for lung cancer," "radiation therapy for lung cancer," and "radiation treatment for lung cancer" were searched on YouTube using a clear-cache browser. The top 50 English-language results for each search were recorded. After removing duplicates, each video was assessed for length, Video Power Index (VPI – the product of a video's average daily views and like : dislike ratio), source, content, comment moderation, and misinformation. Two independent raters were used to ensure consistency.
Conclusions: 88 unique videos resulted from the search. The median video length was 4 minutes and 5 seconds, the median VPI was 1.0, and the median number of views was 954.5. 44% of all videos were published within the past two years. 61% were from the USA, 14% were from the UK, 6% from Australia, 5% each from Canada and India, and others make up the remaining 10%. Most of the videos were published by healthcare facilities (39%) and non-profit organizations (31%). Content-wise, 95% of videos contain information specific for lung cancer and 46 videos (52%) were targeted towards patient education. Of which, 26 described radiotherapy for lung cancer, 1 covered side effects for radiotherapy, and 11 covered both.
Only a small proportion of videos comprehensively cover both radiotherapy and its side effects. The results of our study can help guide development of patient education tools and encourage healthcare providers to recognize limitations of online health information as to proactively address patient questions regarding radiotherapy.
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Title: Quality and Readability of Online Information on Idiopathic Subglottic Stenosis
Authors: Austin Heffernan, Amanda Hu
Affiliations: Division of Otolaryngology – Head and Neck Surgery, Department of Surgery, University of British Columbia
Background: Idiopathic subglottic stenosis (ISS) is a chronic condition characterized by disease recurrence and multiple surgeries. These frustrated patients may utilize the internet to research their condition. In 2013 35% of US adults used the internet to diagnose themselves.

Unfortunately, online resources tend to be low quality and are written at an advanced reading level, however this has yet to be studied in ISS.

Objective: To evaluate the quality and readability of online patient education information on idiopathic subglottic stenosis.

Methods: "Idiopathic subglottic stenosis" was entered into Google. The first 50 websites that met inclusion criteria were extracted. The DISCERN instrument, Flesch Reading Ease Score (FRES), and Flesch-Kincaid Grade Level (FKGL) assessed the quality and readability respectively. Means, standard deviations, Pearson correlation coefficients, and two-tailed Student's T-test were calculated.

Results: The 50 websites consisted of 17 patient-targeted and 33 professional-targeted websites, plus 30 major and 20 minor websites. The overall DISCERN, FRES, and FKGL scores were 2.81 ± 0.99, 27.75 ± 15.27 and 13.65 ± 2.79 respectively (mean ± standard deviation). Patient-targeted websites had significantly lower quality (DISCERN ($p < 0.00$)) but were easier to read (lower FKGL ($p < 0.00$), higher FRES ($p < 0.00$)) than professional-targeted websites. Minor websites had a significantly lower quality (DISCERN ($p < 0.00$)) but were easier to read (lower FKGL ($p < 0.00$), higher FRES ($p < 0.00$)) than major websites. There was a positive correlation between overall quality and difficulty in readability.

Conclusions: The quality of online ISS information was suboptimal. Resources were too difficult to comprehend and readability scores were above American Medical Association and National Institutes of Health recommendations. Improved online information is required to properly educate this patient population.

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Title: The Quality of YouTube Videos on Radiotherapy and Prostatectomy for Prostate Cancer

Authors: Natalie Wong[1], Paris-Ann Ingledew[2,3]

Organization(s): 1: St. George's University School of Medicine, MD Student; 2: BC Cancer-Vancouver Centre, Radiation Oncology; 3: UBC Department of Surgery-Division of Radiation Oncology and Radiotherapeutics

Background: Prostate cancer is one of the most common cancers and the third leading cause of death among Canadian men. While there are many different forms of treatment for prostate cancer, radiotherapy and prostatectomy are common options for a variety of disease stages. Studies have found that the most needed information for cancer patients includes (1) information on the treatment for the disease, and (2) the management of side effects. As information and the convenience of internet access continues to grow, patients are increasingly using online sources, to seek specific medical and cancer related information. With 21.9 billion of the world's population visiting YouTube, and many cancer patients using this as a source of information, it is prudent to understand the quality of information available. This study aims to describe the quality of YouTube videos available to prostate cancer patients with a specific focus on two common treatments (radiotherapy and prostatectomy) and the management of side effects.

Methods: YouTube videos were selected by inputting key phrases such as "Prostate Cancer Radiotherapy or Prostatectomy side effects and/or management" into the YouTube search engine. The first 50 videos were recorded. A rating tool, derived from similar tools used for the evaluation of websites was adapted to analyse the videos for currency, attribution, content, coverage, and accuracy. DISCERN was used to score attribution and content. Materials from NCCN, UpToDate, and cancer.ca were used to develop a consensus document, to evaluate accuracy and coverage of the information presented. Two raters were involved in review of the videos to ensure consistency in rating.

Results: Of the 50 videos analyzed, video length ranged from one min to one hour long, and the dates of creation ranged from 2012 to 2021. All videos were led either by physicians, patients, or allied health professionals (74%, 16% and 8% respectively). Of the three presenters, physician presenters had a Video Power Index (video popularity) of 23.45, while patient presented videos had an average of 61.36. 57% of radiotherapy videos described the procedure or the risks and/or benefits of the procedure while 33% provided a description of the procedure and described risks and benefits of the therapy. For Prostatectomy videos, 53% described the procedure or the risks and benefits of the surgery while 33% provided both a procedural description and risk/benefits. 83% of radiotherapy videos covered side effects, 60% of these videos covered quality of life, and 70% covered special considerations. In comparison, 89% of prostatectomy videos covered side effects, 75% covered quality of life, and 78% covered special considerations concerning the surgery. No false or misinformation was found in the radiotherapy videos, however 13% had either missing or ill-elaborated information for side effects. Similarly no false or misinformation was found in the prostatectomy videos, but 19% videos did not discuss in depth the prostatectomy procedure.

Conclusion: This study provides a description of online resources available to prostate cancer patients. While the majority of information is accurate, not all videos cover quality of life or could be improved to better explain technical aspects of treatment and management of side effects. This information can be helpful for physicians and patients to co-navigate educational needs, improve patient understanding, and increase patient independence in effectively coping and management of their side effects

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Title: Outcomes of Non-surgical Management for Oral Cavity Carcinoma

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Introduction: The majority of head and neck squamous cell carcinoma patients are treated with definitive radiation therapy (RT) or concurrent chemoradiation. However, Surgery is the main treatment modality for patients with oral cavity squamous cell carcinoma (OSCC) while postoperative radiation therapy is indicated mainly for patients with advanced disease or adverse pathologic features. In a substantial proportion of OSCC patients, primary surgical management may not be possible in view of patient-related factors, tumor-related factors, or healthcare system- related factors.

Purpose: To determine the outcomes of oral cavity squamous cell cancer (OSCC) patients treated with non-surgical approach i.e. definitive radiation therapy (RT).

Methods: All OSCC patients treated radically with RT (without primary surgery) between 2005– 2014 were reviewed in a prospectively collected database. OSCC patients treated with definitive RT received concurrent chemotherapy except for early stage patients or those who declined or were unfit for chemotherapy. The 5-year local, regional, distant control rates, disease-free survival (DFS), overall survival (OS), and cancer specific survival (CSS), and late toxicity were analyzed.
Results: Among 690 OSCC patients treated with curative-intent; 227 patients (33%) received non- operative management due to: medical inoperability (n = 41, 18%), surgical unrepeatability (n = 50, 22%), patient declined surgery (n = 39, 17%), attempted preservation of oral structure/function (n = 88, 39%), or due to extensive oropharyngeal involvement (n = 9, 4%). One hundred forty three patients (63%) were examined or discussed with a head and neck surgeon and twenty seven patients (12%) were discussed in the provincial multidisciplinary tumor conference. One hundred and twenty patients (53%) had cT3-4 tumors, 92 (41%) had cN2-3 disease, and 91 (40%) received concurrent chemotherapy. With a median follow-up of 75 months, the 5-year local, regional, distant control rate, DFS, OS, and CSS were 49%, 74%, 85%, 22%, 27%, and 42% respectively.
On multivariate analysis, poorer ECOG performance status, advanced T-stage, and no concurrent chemotherapy was associated with poorer DFS and OS (all $p<0.05$). Grade-3 late toxicity was reported in 10% of patients (most common: grade 3 osteoradionecrosis in 5%).
Conclusions: Definitive radiotherapy management of OSCC resulted in a meaningful but suboptimal disease outcome. Definitive radiotherapy may be used as an alternative curative approach when primary surgery would be declined, unsuitable, or inaccessible. *Jump Back to Abstract List*

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Title: Impact of Disease Extent and Distribution on Outcomes in Stage II Follicular Lymphoma Treated with Curative-Intent Radiation Therapy
Authors: Yi Xu[1], Matthew Chan[2,3], Tom Pickles[2,3], Jessica Chan[2,3], Laurie H. Sehn[1,4,5], David W. Scott[1,4,5], Diego Villa[1,4,5], Alina S. Gerrie[1,4,5], Kerry J. Savage[1,4,5], Andrea C. Lo[2,3,5]
Affiliations: [1]Department of Medicine, University of British Columbia, Vancouver, BC. [2]Department of Radiation Oncology, BC Cancer – Vancouver, Vancouver, BC. [3]Department of Surgery, University of British Columbia, Vancouver, BC. [4]Department of Medical Oncology, BC Cancer – Vancouver, Vancouver, BC. [5]Centre for Lymphoid Cancer, BC Cancer, Vancouver, BC.
Background: Follicular lymphoma (FL) is the most common indolent non-Hodgkin's lymphoma, with 8% of patients presenting with stage II disease. Stage II FL is potentially curable with radiation therapy (RT), but more than half of patients relapse within 10 years. Stage II FL encompasses a broad spectrum of disease extents and distributions. How these factors affect outcomes is not well studied.
Objective: To investigate the impact of disease extent and distribution on outcomes in stage II FL.
Methods: The study included patients who were diagnosed with stage II or IIE, grade 1–3A FL from 1980 to 2016 at BC Cancer, had non-mesenteric disease, and were treated with curative-intent (≥ 20 Gy) RT alone. Our provincial recommendation was to use curative-intent RT for limited-stage patients, with limited stage defined as stage I or II, non-bulky, radio-encompassable disease with no B symptoms. Medical records were reviewed for patient, disease, and treatment characteristics and outcomes. Survival estimates were calculated using the Kaplan-Meier method. Outcomes calculated were freedom from progression (FFP), progression-free survival (PFS), disease-specific survival (DSS), and overall survival (OS). Univariable analyses (UVA) were performed using the log-rank test, and multivariable analyses (MVA) were performed using the Cox proportional hazards model.
Results: 222 patients were diagnosed with stage II, grade 1–3A FL from 1980 to 2016. 56 patients were excluded due to mesenteric involvement. Of the 166 remaining non-mesenteric patients, 16 were excluded due to treatment with chemoimmunotherapy only, 28 due to combined modality therapy, 3 due to palliative RT, 19 due to management with watchful waiting, and 1 due to treatment refusal. The remaining 99 patients formed the study cohort. The median follow-up of living patients was 13.6 years (range, 4.8–35.4), the median diagnosis age was 59.5 years (range, 33.2–86.2), and 56% of patients were male. The median greatest mass diameter was 3.6 cm. 11% had 1 involved lymph node region (staged as IIE due to extranodal disease), 64% had 2 regions, 18% had 3 regions, and 7% had 4 regions. On UVA, age ≥ 60 years was associated with inferior DSS and OS; greatest diameter ≥ 3.5 cm was associated with inferior FFP and PFS; disease involving the paraaortic region was associated with inferior FFP and PFS; and involvement of 4 lymph node regions was associated with inferior PFS. On MVA, greatest diameter ≥ 3.5 cm and involvement of 4 lymph node regions were associated with an inferior FFP and PFS, while older age was associated with an inferior DSS and OS. Bilateral disease, infradiaphragmatic disease, and extranodal involvement did not correlate with worse outcomes on UVA or MVA.
Conclusions: Greatest diameter of disease ≥ 3.5 cm and involvement of 4 lymph node regions are significantly associated with inferior FFP and PFS in non-mesenteric stage II FL patients treated with curative-intent RT alone. These results may assist clinicians with identifying patients at higher risk for progression, facilitating improved treatment decision-making and patient counselling.
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Title: Virtual surgical planning for maxillary reconstruction with the scapular free flap: an evaluation of a simple cutting guide design
Authors: Khanh Linh Tran, Jae Young Kwon, Jenny Gui, James Scott Durham, Eitan Prisman
Affiliations: Division of Otolaryngology, Department of Surgery, University of British Columbia, Canada
Background: Maxillary reconstruction is challenging due to the complex anatomy of the maxilla. Virtual surgical planning (VSP) allows the surgeons to pre-plan the reconstruction and 3D-print cutting guides and models for intraoperative use. In the literature, VSP for maxillary reconstruction typically utilize commercial services which can be cost prohibitive, and the guides designed complex. The authors have developed an in-house VSP platform for planning of mandibular and maxillary reconstruction surgeries.
Objective: The goal of this study is to assess maxillary reconstruction with the scapular free flap utilizing an in- house VSP with a simple cutting guide design compared to a historical control cohort undergoing freehand surgery without preplanning.
Methods: Ten maxillary reconstruction cases were planned with VSP using an in-house software. Models of the reconstruction and scapular resection were 3D printed and used intraoperatively for visualization and estimation of the size and position of the flap. Clinical outcomes, functional outcomes, cephalometrics measurements, and dental implantability were compared to 18 historical control cases not utilizing VSP.

Results: Patients in the VSP cohort were more likely to undergo surgeries with a two-team approach (80% vs 0%, p<0.01) and had a significantly lower tracheostomy rate (20% vs 72%, p<0.01). VSP resulted in significantly lower operating time (256 ± 69 minutes vs. 448 ± 108 minutes, p<0.01) and lower deviation between the reconstruction and pre-operative maxilla (7.5±3.4 mm vs 11.7±7.6 mm, p=0.048). There was no significant difference in length of hospital stay, complication rates, dental implantability rates, or functional outcomes.
Conclusions: VSP with a simple cutting guide design has cost-reduction potential by allowing for a two-team approach and decreasing operating time. This technique could lead to fewer complications associated with tracheostomy and better esthetic outcomes for patients. The VSP method introduced in this study is open-source, inexpensive and can be reproduced at other centres.
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Title: Implementation of the CBME framework in a UBC-MSF Essential Surgical Skills Training Program
Authors: Irena Zivkovic1, Mina Salehi2, Sukhdeep Jatana3, Shahrzad Joharifard4, Emilie Joos2,5
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Background: South Sudan has one of the lowest surgical workforce densities in sub-Saharan Africa. With task- sharing being a cost-effective training method, the University of British Columbia signed a Memorandum of Understanding with Médecins Sans Frontières in 2019 to create the Essential Surgical Skills program, launched in Aweil, South Sudan. This program was developed using a Competency-Based Medical Education framework, critical to evaluating trainee progress.
Objective: Assess the feasibility of implementing a CBME-based essential surgical skills task-sharing program in South Sudan.
Methods: This is a mixed-method prospective cohort study. Entrustable Professional Activities (EPAs) and Milestones were mapped to the training curriculum, which was designed to focus on common surgical pathologies in South Sudan. A total of 60 individual EPAs were developed across eight different modules. EPAs were reviewed quarterly by an external competence committee, in order to evaluate the progression and competency of the trainees. Trainee competency was defined as an EPA score $\geq$4 for that procedure. Additional quantitative data points included procedure logbooks, morbidity and mortality rates and quiz results. Semi-structured interviews will be performed with trainees at the completion of the training program.
Results: From May 2019 to August 2021, trainees have completed 267 EPAs, with a total count of 416 procedures contributing to 31% of all procedures taking place at Aweil State Hospital, South Sudan. Of the 60 available EPAs, 63% (38/60) have been completed at least once by MSF surgical faculty observing the trainees. Overall, the trainees have achieved competency in 60% (36/60) of EPAs, for procedures including chest tube placement, laparotomy, cesarean section, open fracture management, and skin grafting. Hospital mortality and surgical morbidity rates at the institution were respectively 10% and 17% pre-implementation, and 17% and 11% post- implementation of the program. Quiz pass rate for all trainees was 100%.
Conclusions: Trainees have had multiple points of observation throughout their training by MSF surgical staff, and in a variety of procedural settings as indicated by high total completed EPA counts and significant contribution to the institution's procedural volumes. High and diverse capture rates of EPAs reflect the feasibility of implementation of the CBME-based program, further highlighted by the strong ongoing achievement of trainee competencies in surgical skills. Overall, this indicates successful uptake of key evaluation components of CBME on- site in a low-resource setting, in concert with a virtual-based competence committee. This demonstrates the possibility of implementing similar evaluation methods in other low-resource settings.
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Title: A Comparative Study Assessing Improvement in Cognitive Deficit Secondary to CRS in Patients Treated with Surgical Management: A Prospective Trial
Authors: Mohammadali Saffarzadeh, Athenea Pascual, Laura Samson, Jenna Angela Kaur Gill, Amin Javer
Affiliations: St. Paul's Sinus Centre
Background: Cognitive performance is negatively impacted in patients with chronic inflammatory conditions. Functional Endoscopic Sinus Surgery (FESS) has shown to improve cognition in patients with Chronic rhinosinusitis (CRS). However, there are currently no studies that have evaluated the effects of delay in surgery on long-term cognitive function while on surgical waitlists. Additionally, it remains unclear if receiving surgery earlier will have an effect on the degree and length of improvements in cognitive performance.
Objective: This study aims to compare cognitive improvements in patients who are undergoing FESS earlier for CRS treatment to that of patients who receive surgery later as a result of long waitlists.
Methods: We will prospectively recruit patients diagnosed with CRS (with or without polyps) who are on the waitlist to receive FESS at St Paul's Sinus Centre. Participants will be separated into one of 2 study arms: group 1 will consist of patients who undergo surgery within three months of signing their consent for surgical management. Group 2 will include patients on the surgical waitlist receiving sinus surgery after a minimum waiting period of at least 1-year. The primary outcome measure is the change in cognitive performance assessed by the Modified Mini Mental Examination (3M). Secondary outcome measures include the change in Sino-Nasal Outcome Test-22 (SNOT-22), Cognitive Failures Questionnaire, and nasal endoscopy. All outcome measures will be obtained at the time of recruitment for establishing a baseline, 1 week before surgery, and again at 6 and 12 months after the operation.
Results: A combined total of 98 patients on the waitlist have been approached so far, and 13 patients are now enrolled in the study. The baseline cognitive function assessed by mean (SD) scores on 3M and Cognitive Failure Questionnaire were 96.25 (2.75) and 40.75 (19.19) in group 1 (n=4) and 94.88 (4.19) and 43.13 (21.49) in group 2 (n=9) respectively. The rhinological outcome measures assessed by mean (SD) scores on SNOT-22 were 46 (20.51) in group 1 and 49.25 (20.14) in group 2. All patients in group 1 have undergone FESS, while the patients in group 2 are still on the waitlist for surgical intervention.

Conclusions: This ongoing prospective cohort study will inform clinicians and stakeholders about the potential risks of surgical delay in patients with CRS, thus allowing healthcare professionals to advocate for faster surgical interventions.
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Title: The efficacy of debridement of the sinus cavity following primary functional endoscopic sinus surgery (FESS): A randomized controlled trial**.**
Authors: Athenea Pascual, Juan Hernaiz, Bader Alim, Bahar Ahmadi, Laura Samson, Amin Javer
Affiliations: St. Paul's Sinus Centre, St. Paul's Hospital
Background: Chronic Rhinosinusitis (CRS) is inflammation of the nasal cavity and paranasal sinuses lasting at least 12 weeks. CRS cases that do not respond to medical therapy are usually treated by Functional Endoscopic Sinus Surgery (FESS). Debridement or cleaning of the sinuses post-operatively, has been described as a regular post-surgery procedure to be done on a weekly or biweekly basis that might help to reduce incidence of post-FESS synechiae (sinus scar formation). However, frequent post- operative debridement may cause pain and discomfort to the patient. There is a lack of clear evidence showing the benefit of sino-nasal debridement after FESS. We propose a randomized clinical trial (RCT) to determine the benefit of debridement in postoperative care.
Objective: This study aims to compare short- and long-term outcomes in patients who are undergoing FESS + post-operative debridement to patients who receive FESS and no debridement after surgery.
Methods: This is an ongoing RCT enrolling CRS patients who undergo FESS. 150 participants will be randomized into either receiving routine post-operative debridement (treatment group) or not (control group) after FESS. Patients will be asked to return for 4 follow-up visits at days 6, 30, 60, 90 and 180. The primary outcome measure will be the formation of postoperative synechiae from baseline to day 180. This outcome will be determined by a blinded assessor not involved in the clinical trial. As secondary outcomes, we will analyze the change in patients' symptoms with the Sino-Nasal Outcome Test-22 (SNOT-22), the change in nasal endoscopic scores and the pain and discomfort levels following the procedures using a Visual Analog Score (VAS).
Conclusion: This study will help justify the need (or not) for postoperative sinus debridement in CRS patients undergoing FESS.
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Title: Effects of endoscopic sinus surgery on maxillary sinus volume in silent sinus syndrome: a retrospective tomographic study
Authors: Juan Carlos Hernaiz-Leonardo[1], Marwan Alqunaee[1], Saba Moghimi[2], Bader M. Alim[1], Farnaz Javadian[3], Saba Vafaei-Nodeh[4], Athenea Pascual[1], Amin Javer[1]
Affiliations: [1] Department of Otolaryngology – Head and Neck Surgery, UBC. [2] Department of Radiology, UBC. [3] Department of Ophthalmology, UBC. [4] Faculty of Medicine, UBC.
Background: Silent sinus syndrome (SSS) is a rare, acquired condition characterized by unilateral maxillary sinus atelectasis that causes a reduction in sinus volume. Endoscopic sinus surgery (ESS) resolves the negative pressure differential in the maxillary sinus by removing the uncinate process; however, it is unclear if this procedure is sufficient to cause an increase in the maxillary sinus volume.
Objective: The aim of this study is to evaluate whether ESS causes an increase in the maxillary sinus volume in SSS patients.
Methods: We retrospectively evaluated preoperative and postoperative sinus CT scans of 25 patients (50 CT scans) diagnosed with SSS that underwent ESS between 2006 to 2018. Maxillary sinus volume measurements are being carried out using the region of interest (ROI) volume tool in Horos v 0.4 for both sides, regardless of the presence of sinus surgery. Demographic and clinical variables, including age, gender, type of CRS, extent of surgery, time between ESS and CT scan, smoking status, presence of comorbid conditions (e.g., type 2 diabetes, hypertension), and presence of sinus or visual symptoms are captured for each patient. The primary outcome is postoperative maxillary sinus volume, and the primary predictor is ESS. We will use a multiple linear regression model to assess the effects of ESS on postoperative maxillary sinus volume adjusting for baseline sinus volume, time between CT scans, and other potential confounders.
Conclusions: Given the rarity of this disease, it is unfeasible to perform a randomized controlled trial that can accurately answer our research question. Moreover, case series and anecdotal evidence on SSS often suggest orbital surgery is necessary for these patients. This study will show whether ESS is sufficient to cause an increase in the sinus maxillary volume in SSS patients, reducing the need for orbital surgery. Our results will inform clinicians on what changes to expect after ESS, thereby directly improving preoperative planning.
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Title: Use of Vessel-Sealant Devices, Intraoperative Nerve Monitoring, and Surgical Drains and their Association with Neck Hematoma and Recurrent Laryngeal Nerve Injury: Thyroidectomy Practice Patterns from NSQIP
Authors: Christina Schweitzer MD MPhil, Sam Wiseman MD FRCSC FACS
Affiliations: University of British Columbia, Division of General Surgery; St. Paul's Hospital
Introduction: The American Association of Endocrine Surgeons (AAES) thyroidectomy guidelines consider vessel-sealant devices (VSD), such as the Ligasure electrothermal bipolar cautery or the Harmonic ultrasonic coagulator, to decrease operative time with safety and efficacy comparable to knot tying. Intraoperative nerve monitoring (IONM) is recommended as a safe adjunct that may assist the surgeon in identifying the recurrent laryngeal nerve (RLN). Drains are not recommended as they do not improve outcomes and may increase postoperative infection rates, pain, and length of hospital stay.
Objective: This research sought to understand the real-world, contemporary practice patterns for thyroid surgeons with respect to use of VSDs, IONM and drains, as well as their safety profiles.
Methods: The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) Thyroidectomy database was analysed from its introduction in 2016 through 2018. The primary outcome was rate of VSD, IONM, and surgical drain utilization. The secondary outcomes were rates of RLN injury and neck hematoma, both of which can lead to airway obstruction and need for repeat surgery, or even a permanent tracheostomy, in severe cases of RLN injury. For secondary outcomes, cases were excluded if either adjunct or complication were unknown.

Results: From 2016-2018, 18,078 thyroidectomies were registered in the NSQIP thyroidectomy database. VSD in was used in 63.9% of cases, and IONM in 63.0%. Both VSD and IONM were used in 45.4% of cases. VSD but not IONM was used in 18.1%, and IONM but not VSD in 16.2% of cases. Neither was used in 17.4% of cases. A surgical drain was used in 28.0% of cases.
Neck hematoma occurred in 1.8% of thyroidectomies. When VSD was used, rate of neck hematoma was 1.6% compared to 2.2% without VSD (p=0.005). Use of surgical drain was associated with a numerical increase in rates of neck hematoma from 1.8% to 2.0% (p=0.43).
RLN injury occurred in 6.1% of cases. IONM was associated with a lower rate of RLN injury, at 5.7% vs. 6.8% without (p=0.003). Where VSD was used without IONM, the RLN injury rate was 7.4%, vs. 5.7% when both were used (p<0.001).
Conclusions: Less than half of thyroidectomies are performed with both VSD and IONM (45.4%). Observations made in this large real-world, multicenter contemporary thyroidectomy patient population support increased uptake of VSD and IONM as safe adjuncts in thyroidectomy, as they are associated with reduced rates of neck hematoma and RLN injury, respectively. When VSD is used, IONM should also be used to reduce the associated risk of RLN injury. Drains are not associated with reduced risk of post- operative hematoma and should not be used routinely.
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Title: Sinonasal Microbiota Transfer (SNMT) for recalcitrant chronic rhinosinusitis: A randomized controlled clinical trial
Authors: Juan Carlos Hernaiz-Leonardo[1,2], Sandeep Gill[1], Bader M. Alim[2], Marwan Alqunaee[2], Athenea Pascual[2], Amee Manges[1], Amin Javer[2]
Affiliations: [1] School of Population and Public Health, University of British Columbia. [2] Department of Otolaryngology – Head and Neck Surgery, University of British Columbia.
Background: Chronic rhinosinusitis (CRS) is a common inflammatory condition of the paranasal sinuses that affects up to 12% of the North American population. Although the pathophysiology of CRS remains unknown, there is consensus that the presence of biofilm and bacterial infection are of primary importance. To date, there is a lack of effective treatment for recalcitrant cases of CRS that fail to respond to adequate medical and surgical therapy.
Objective: To assess the efficacy of an endoscopic sinonasal microbiota transfer (SNMT) for treating recalcitrant CRS.
Methods: We will test SNMT's efficacy in an open-label, three arm, randomized controlled trial. A total of 75 patients will be randomly assigned into one of three arms: (I) antimicrobial photodynamic therapy (aPDT), which serves as pretreatment for SNMT, (II) aPDT + SNMT or (III) SNMT alone. Included participants must be > 18 years old, diagnosed with CRS, have undergone primary endoscopic sinus surgery, remain symptomatic despite maximal medical therapy, and have evidence of infectious exacerbations either by positive bacterial cultures or endoscopic findings. The primary endpoint is endoscopic improvement assessed by the modified Lund-Kennedy (MLK) scoring system at 30 days post- intervention. Secondary outcomes include improvement in the sinonasal outcomes test (SNOT-22) score, the University of Pennsylvania Smell Identification Test (UPSIT), and the Lund Mackay tomographic scores. MLK scores will be recorded at each visit and blindly assessed by two independent surgeons. SNOT-22 scores, mucosal biopsies, and sinus swabs will be taken at baseline and days 30, 90, 180 and 365 post- interventions. Smell testing and CT scans will be performed at baseline and 180 days. Potential SNMT donors will undergo extensive bloodwork, bacterial culture, and endoscopic testing to rule out infectious diseases and undiagnosed sinonasal pathology before being included. SNMT donors and recipients will be matched according to EBV and CMV serology status. Parallel mechanistic studies will explore if and how SNMT helps patients recover using metagenomic sequencing of mucus samples coupled with tissue and serum immunophenotyping. The trial has been approved by the University of British Columbia Research and Ethics board and hold a No Objection Letter (NOL) from Health Canada.
Conclusions: To our knowledge, this trial represents the first attempt to treat recalcitrant CRS using an endoscopic sinonasal microbiota transplant. Similar treatment strategies – mainly fecal microbiota transplants – have proven successful for treating inflammatory conditions like ulcerative colitis and atopic dermatitis. It is likely that a similar microbiota-altering intervention will improve sinonasal inflammation by treating the underlying dysbiosis found in CRS patients. If successful, SNMT has the potential to permanently change how we approach recalcitrant CRS treatment.
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Title: Doxycycline's effect on epistaxis in patients with hereditary hemorrhagic telangiectasia: A tertiary centre's experience.
Authors: Bader M Alim, Juan C Hernaiz, Mohammad A Saffarzadeh, Amin R Javer Affiliation: St. Paul's Sinus Centre, Vancouver, Canada
Background: hereditary haemorrhagic telangiectasia (HHT) affects 1 in 5–8000. It is inherited as an autosomal-dominant trait. There was an early recognition of HHT-affected individuals developing abnormal vascular structures, particularly AVMs of the pulmonary, hepatic and cerebral circulations. AVMs of the nose are a common cause of recurrent and challenging epistaxis episodes. Multiple management options have been described in the literature to try to control the epistaxis in this patient group of patients including doxycycline.
Objectives: The primary objective of the current study was to assess the Change in epistaxis severity score (ESS) for patients on epistaxis who were started on doxycycline antibiotic for 3 months. The secondary objective was to study the changes in the hemoglobin, need for blood and iron transfusion, and number of AVMs per high power field in HHT patients on doxycycline.
Methods: This was a retrospective chart review of the HHT patients attending rhinology clinics at our tertiary care centre from 2013-2021 who were kept on doxycycline for at least 3 months period. ESS, Hgb, ferritin, and AVMs per high power field were collected before and after starting doxycycline.
Conclusion: Epistaxis due to HHT is a challenging condition and needs specialized care to get it under control. Doxycycline was found to be one of the helpful adjunct medical therapies that helped decrease the severity of epistaxis in this group of patients.
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Title: Surgical outcomes in patients with aspirin exacerbated respiratory disease: A tertiary care centre's experience.
Authors: Bader M Alim, Juan C Hernaiz, Ibreez Asaria, Amin R Javer Affiliations: St. Paul's Sinus Centre, Vancouver, Canada.

Background: NSAID exacerbated respiratory disease (NERD) is a type 2 inflammatory subtype of chronic rhinosinusitis. It is known to be one of the most challenging sino-nasal diseases to treat and control. Multiple therapeutic measures have been described in the literature that aim to control symptoms and lower exacerbations like aggressive surgeries, aspirin desensitization (AD), and monoclonal antibody therapies (MAT). Although each of these measures may provides meaningful clinical improvement, the benefits are counterbalanced by relatively high rates of adverse effects and cost. AD – the only etiological treatment for NERD - is hard to implement outside specialized units and often leads to adverse gastrointestinal events that result in discontinuation and patient dissatisfaction. We believe that having frequent follow-up appointments can lead to low rates of recurrence, regardless of the extent of surgery in patients without AD.
Objectives: The primary objective of the current study was to explore the effects of close follow- up appointments and the extent of sinus surgery in the surgical revision rate of NERD patients without AD who underwent full house sinus surgery (FHESS) at St. Paul's Sinus Centre.
Methods: A retrospective chart review was conducted of N-ERD patients who underwent FHESS followed by daily budesonide irrigations without AD or MAT. The primary outcomes were revision surgery rate and time to revision surgery. Secondary outcomes included changes in 22- item Sino-Nasal Outcome Test (SNOT-22) scores and Lund-Kennedy endoscopy scores (LKES). Our main exploratory variables were the frequency of follow-up appointments and the extent of sinus surgery.
Conclusion: NSAID exacerbated respiratory disease represents a clinical challenge for rhinologist to get under control. Adjunctive treatment measures help stabilizing the disease, but don't come without their countereffects. We hypothesise that N-ERD patients can stay well controlled using a meticulous surgical techniques and standard of care post-operative management when close follow-ups appointments are implemented.

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Title: Intraoperative Nerve Monitoring (IONM) is Associated With Reduced Risk of Recurrent Laryngeal Nerve Injury from Thyroidectomy: An Analysis of 17,688 NSQIP Patients
Authors: Christina Schweitzer MD MPhil, Sam Wiseman MD FRCSC FACS
Affiliations: University of British Columbia, Division of General Surgery; St. Paul's Hospital
Introduction: Recurrent laryngeal nerve (RLN) injury is a dreaded complication of thyroid surgery. This may result in airway obstruction requiring additional surgery, and even the need for permanent tracheostomy in severe cases. Intraoperative nerve monitoring (IONM) may be used to assist the surgeon in identifying the RLN nerve, with the goal of reducing the risk of RLN injury. One third of surgeons performing thyroidectomies do not routinely use IONM.
Objective: The aim of this study was to determine whether use IONM during thyroidectomy influenced the risk of RLN injury.
Methods: The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) Thyroidectomy database was analysed from its introduction in 2016 through 2018. The primary outcome was incidence of RLN injury, defined as occurrence of hoarseness, weak voice or vocal cord dysfunction beyond the first postoperative day. Cases were excluded if either IONM use or RLN injury were unknown. Multivariate logistic regression modelling was performed.
Results: IONM was used in 63.8% of thyroidectomies. There were 1,077 RLN injuries reported in total, a rate of 6.1%. There was a statistically significant decrease in risk of RLN injury associated with the use of IONM for thyroidectomy, from 6.8% to 5.7% (p=0.003, relative risk -16.3%, absolute risk -1.1%). For thyroid cancer operations, the RLN injury risk fell from 7.7% to 6.5% with use of IONM (p=0.039, relative risk -16.6%, absolute risk -1.3%). For benign thyroid disease, the RLN injury risk decreased from 6.1% to 5.2% when IONM was used (p=0.042, relative risk -15.4%, absolute risk -0.9%). Using a multivariate logistic regression model, IONM use is associated with a significantly decreased risk of RLN injury in thyroidectomy with an odds ratio (OR) of 0.79 (95% CI 0.68-0.92, p=0.002). Other significant variables include known malignancy as indication for surgery; thyroid cancer on final pathology; bilateral thyroid surgery; Asian, Black, or African American race; and age.
Conclusions: Observations made in this large multicenter contemporary thyroidectomy patient population support the increased adoption of IONM during thyroidectomy, especially when performed for treatment of thyroid cancer, in order to reduce the risk of RLN injury.
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Title: Assessing the Social Determinants of Health and Adverse Childhood Experiences in Patients Attending a Children's Hospital Cleft Palate-Craniofacial Program: A Quality Improvement Study
Authors: Ethan Ponton, BSc[1,2]; Rebecca Courtemanche, MSc[3,4]; Tanjot K Singh, MTM, MD[5]; Damian Duffy, MSc[1,6]; Douglas J Courtemanche, MD, MS, FRCSC[3,4]; Christine Loock, MD, FRCPC[5,7]
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Background: Canada has one of the highest orofacial cleft rates in the world at approximately 1 in 790 live births. There are 21 cleft centers in Canada. Our program has over 2400 active patients in a province with approximately 1 million children and youth. Patients require care from a wide variety of specialists. Current literature describes the social and psychological implications of undergoing reconstructive surgery for cleft and/or craniofacial abnormalities in children; however, there are also psychosocial and socioeconomic implications of cleft care for both the child and caregivers. Although psychosocial and socioeconomic needs of patients with orofacial clefts have been previously described, there is limited information on social determinants of health (SDoH) for this patient population.
Objective: This study aimed to describe the SDoH for patients receiving multidisciplinary team care in a cleft and craniofacial program, develop responsive and consistent processes to include trauma-informed psychosocial histories, promote discussions about additional "non-medical" factors influencing health and surgical outcomes, and demonstrate that these activities are feasible in the context of multidisciplinary patient-provider interactions.
Methods: This was a quality improvement study conducted with all patients attending the BC Children's Hospital Cleft Palate and Craniofacial program over a 2-year period. The first survey used included questions related to demographics, social and material capital, healthcare utilization and access, food security, housing security, financial security, and adversity and resiliency factors. After one year, preliminary data were reviewed to shorten the questionnaire for use in a busy clinical setting. The questions most likely to indicate a family

was in need were identified and formed our BEARS questionnaire, which included five key categories: **B**arriers to care, **E**conomic factors, **A**dversity, **R**esiliency, and **S**ocial capital.
Conclusions: 34% of families experience significant barriers to accessing primary health care, 51% struggle financially, and 11% scored four or more on the Adverse Childhood Experiences scale.
Furthermore, 47% reported not having adequate social support in their lives, and 5% reported not feeling resilient at the time of the survey. Patients with cleft and craniofacial anomalies have complex needs that extend beyond the surgical and medical care they receive. It is critical that all Cleft and Craniofacial teams incorporate social histories into their clinic workflow and be responsive to these additional needs. Discussions surrounding SDoH and adversity are welcomed by families; being involved in the care and decision-making plans is highly valued. Healthcare providers can and should ask about adverse SDoH as well as protective factors and advocate for universal access to responsive, site-based, social supports for their patients.
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Title: MED15 Enhances Maturation of Insulin-Producing Human Stem Cell-Derived Pancreatic β-cells: Implications for Diabetes Treatment
Samantha Mar[1,2], Francis C. Lynn[1,2]
Organization(s): 1: General Surgery, Department of Surgery, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada; 2: Diabetes Research Group, BC Children's Hospital Research Institute, Vancouver, BC, Canada
Introduction: Death or dysfunction of insulin-producing pancreatic β-cells results in diabetes. One way in which β-cells can become dysfunctional is through the disruption of β-cell gene regulatory networks that maintain gene expression, regulate glucose-stimulated insulin secretion (i.e. maturation) and prevent type 2 diabetes. Recent work in our lab demonstrated that master gene regulator Mediator subunit 15 (Med15) is essential for modulating β-cell development, maturation, and function in mice. Our previous Med15 DNA-binding and gene expression analyses revealed that Med15 binds and regulates key β-cell maturation genes, including *IAPP* and *UCN3*. We also showed that human pancreatic islets express MED15; and its expression is reduced in type 2 diabetes.
Objective: We aim to test whether MED15 drives maturation of human embryonic stem cell (hESC)-derived β-cells (SC-β) *in vitro*.
Methods: We increased the expression of MED15 in SC-β by using CRISPR-Cas9 to insert a copy of MED15 into the insulin gene (*INS*) coding region in H1 hESCs (MED15βOE). We then differentiated MED15βOE into insulin-producing β-cells using a recently published method and performed gene expression analysis on them.
Results: We validated that the differentiation of MED15βOE occurs with similar efficiency as a control *INS* reporter cell line. We also demonstrated that MED15βOE express higher levels of key β-cell maturation markers *UCN3* and *IAPP,* which are Med15 targets, by 2- and 3-fold respectively compared to the control cell line.
Conclusions: These data show that elevated MED15 expression enhances SC-β maturation *in vitro* and that MED15 targets are conserved, suggesting MED15 is important for human β-cell maturation. As such, therapies that restore the function of MED15 and its targets may prove useful as diabetes treatments.
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Title: Surgery in the Western Canadian Arctic: Using a Logic Model to Understand and Strengthen a Rural Surgical System
Authors: Ryan Falk[1], Dawnelle Topstad[2]
Affiliations: 1. Branch for International Surgical Care, Department of Surgery, UBC; 2. Department of Surgery, University of Calgary
Background: Rural and remote (and often indigenous) populations have worse health outcomes when compared with their urban counterparts. Little is known about the surgical needs of such populations, and the delivery of surgical services to such geographically isolated regions poses many challenges. The networked model of care integrating Family Physicians with Enhanced Surgical Skills (FPESS) and Specialist Surgeons (SS) provides one sustainable solution.
Objective: This project studied the system of surgical care delivery for the population living in one circumpolar region of the western Canadian Arctic, the Beaufort Delta, 1) to describe the burden of surgical disease as reflected through procedures performed; 2) to understand the role of and interaction bewteen surgical care providers throughout the health system for this defined population; 3) to develop a logic model describing the current program of surgical service delivery; 4) to make initial program recommendations to benefit the host surgical system.
Methods: Using a participatory approach, a logic model was developed to describe the delivery of surgical services to the Beaufort Delta Region. Semi-structured interviews were conducted within the Northwest Territories Health & Social Services Authority in an iterative process and analyzed in NVivo12. Quantitative methods were also proposed to contribute to an understanding of the surgical needs of the population, as well as the relative impact of each type of surgical care provider in the overall care for the region.
Results: The logic model is presented in graphic and narrative form, detailing the roles of providers involved in surgical care, from community health nurses (CHNs) to sub-specialist surgeons at the tertiary care centres of Edmonton, Alberta. The focus, however, is on the role and interactions between FPESS and SS in the surgical care provided to the region in the demonstration of this networked model of care. Sixteen key recommendations to improve the host surgical system are made. The quantitative data access was delayed and remains under analysis at the time of writing.
Conclusions: This study provides insight into a functioning example of a networked model of surgical care, where FPESS and SS work together to improve access to surgical care for this disadvantaged population. Further study into this model can contribute to a better understanding of circumpolar surgical needs and care delivery and may benefit other global regions facing similar challenges in the delivery of surgical care.

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Title: Navigating Radiation Therapy During COVID-19 Using YouTube as a Source of Information
Authors: Zhang Hao (Jim) Li [a], Inhwa Kim BSc [b], Meredith Giuliani MBBS, MEd, PhD, FRCPC [c, d], Paris-Ann Ingledew MD, FRCPC, MHPE [e, f]
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Background: The COVID-19 pandemic brought considerable change to the practice of radiotherapy. In the meantime, patients are increasingly turning to online resources for health information, with YouTube being one of the biggest platforms. However, little is known about what information is being disseminated to cancer patients about radiotherapy in the context of COVID-19.
Objective: This study aims to characterize and assess YouTube videos on radiotherapy during COVID-19.
Methods: A YouTube search using the terms "Radiation therapy COVID-19", "Radiation therapy coronavirus", "Radiotherapy COVID-19", and "Radiotherapy coronavirus" was completed using a clear- cache web browser. The top 50 videos were collected from each search. After applying pre-determined exclusion criteria, each video was assessed for general parameters, source, and content. Two raters were used to ensure interrater reliability.
Conclusions: 105 unique videos resulted from the four searches. 98% were published in the last year. The median video length was 6 minutes and 54 seconds, and the median number of views was 570. Most videos were from the United States (58%). The majority of videos were published by a commercial channel (31%), non-profit organization (28%), or health care facility (26%). 42% of videos covered a topic related to radiotherapy during the pandemic. Misinformation was present in 5% of videos.
YouTube information on radiotherapy during COVID-19 is non-specific and can be misleading. The results of this study highlight the need for healthcare providers to proactively address patient information needs and guide them to appropriate sources of information.
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Title: Pediatric Cochlear Implant Complications and Explantation at BC Children's Hospital utilizing a Single Manufacturer over a 33-Year Period
Authors: Vincent Hou[1], Paula Andrea Tellez[2], Marcela Fandino[3], Juan Ospina[2], Ruth Chia[1], Raegan Bergstrom[1], Jessica Kozak[1], Julie Pauwels[1], Emelie Kozak[1], Frederick Kozak[1]
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2. *Division of Otolaryngology, Pontificia Universidad Javeriana, Colombia*
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Introduction: Cochlear implantation (CI) is indicated for pediatric patients with bilateral severe to profound sensorineural hearing loss. The literature reports large variability in CI device survival and rates of explantation and reimplantation.
Objective: This retrospective chart review aims to summarize the post-CI outcomes in pediatric patients at a single institution utilizing a single manufacturer over 33 years.
Methods: A retrospective chart review was completed for all pediatric patients who received a Cochlear Corporation CI at BC Children's Hospital between April 1988 and March 2021. Rates of complications, explantation/reimplantation were collected and organized based on device type and reason for failure (medical, device, and inconclusive failure). Device survival analysis based on the implant model was also completed utilizing Kaplan-Meier curves.
Conclusions: 533 CIs were completed over the 33 years by four surgeons. Patient age ranged from 7 months to 20.4 years. The overall explantation and reimplantation rate was 3.19% (17/533 implants), with 7 events of device failure (1.32%), 9 events of medical failure (1.69%), and 1 inconclusive failure from electrode extrusion of unknown etiology (0.19%). The mean age of explantation was 9.64 years (3.25 – 18.75 years). For medical-related infectious failures, organisms were identified in four cases. Kaplan-Meier analysis of CI survival rates at 5, 10, 15, and 20 years were 98.23%, 96.52%, 95.84%, and 94.91%. In addition to cochlear explantation, there were 46 intraoperative and 63 postoperative complications.
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Title: Pre-operative COVID-19 testing is not necessary in a low prevalence setting
Authors: Lina Cadili, Martha Talbot, Rebecca Afford, Karina Spoyalo, Phil Dawe, Victor Leung, Rebecca Warburton, Carl Brown, Andrea MacNeill and Ahmer Karimuddin
Affiliations: UBC Department of General Surgery, Division of Surgery

Introduction: COVID-19 raised many questions regarding how to safely and effectively screen and test patients for COVID-19 prior to undergoing elective and emergent surgery.
Objective: To determine the rate of undetected COVID-19 in patients undergoing general surgery procedures in Vancouver in a time of low COVID-19 prevalence.
Methods: All patients who underwent urgent or emergent general surgery during the first four weeks of the pandemic across four Vancouver hospitals were included. Pre-operative COVID-19 screening and testing information was collected, and follow-up was conducted 30 days post-operatively.
Results: Three-hundred and twenty-eight patients were included and none were diagnosed with COVID- 19 pre-operatively or post-operatively. All patients underwent pre-operative questionnaire screening, 16 patients screened positive and nine went on to have negative nasopharygeal (NP) swab testing, while seven had their symptoms attributed to their underlying disease pathology. One-hundred and four asymptomatic patients had negative pre-operative NP swabs. Post-operatively none of the patients screened or tested positive for COVID-19. During the study period the province of British Columbia recorded 1699 cases of COVID-19 for a population of 5.1 million people.

Conclusions: As we move into subsequent phases of the pandemic it is imperative to have ongoing plans to provide safe surgical care without testing delays. In communities with low prevalence of COVID-19, it is safe to proceed with urgent or emergent surgery with appropriate preoperative COVID-19 screening and definitive testing for symptomatic patients only.

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Title: The efficacy of silastic sheet nasal splints in endoscopic nasal septal repair surgery: a prospective, randomized, single-blinded controlled trial

Authors: Fahad Alasousi, Judy Fan, Athenea Pascual, Juan Carlos Hernaiz-Leonardo, Amin R Javer
Affiliations: St. Paul's Sinus Centre, Vancouver, Canada

Background: Septoplasty or endoscopic nasal septal reconstruction (eNSR) is one of the most commonly performed surgeries in rhinology. Complications include nasal crusting, persistent deviation, infection/septal abscess, septal perforation, septal hematoma, and external deformity. To prevent these complications, the trans-septal suture (quilting) technique is almost always combined with some sort of nasal packing or splints. However, there is no evidence of the efficacy of using only the quilting method when compared to the current standard of care of adding a nasal silastic splint which adds time and extra cost to the surgery.

Objective: To evaluate the efficacy of the quilting technique with and without the addition of a nasal splint after eNSR.

Methods: A prospective single blinded randomized control trial was conducted at St. Paul's Sinus Centre, with approval from the University of British Columbia – Providence Health Care Research Ethics Board (H15-03025). 92 patients completed all phases of the trial. At the end of the septoplasty and after quilting stitches were placed endoscopically, participants were randomized to either receive Doyle II Nasal Septal Splints (Medtronic XOMED) on both sides of the septum (n=42) or not (n=50). Mladina classification of the nasal septal deviation score and the Nasal Obstruction Septoplasty Effectiveness (NOSE) scale were recorded for each patient at baseline (pre-op), 6 weeks and 12 weeks. Data on intra- and post-operative complications was recorded.

Results: The proportion of deviation was reduced from 100% to 3.3% after 12 weeks. No significant difference was found in the Mladina score and the NOSE scale between the splint and non-splint group at 6 and 12 weeks. Moreover, there were no findings of postoperative adhesions, perforations or other relevant complications in either group.

Conclusion: the use of bilateral splints following eNSR is not significantly helpful for a successful surgical outcome when a proper quilting stitching technique is utilized. When the cost of the splints as well as the extra step of removing them is taken into consideration, the addition of using silastic nasal splints following eNSR seems unnecessary.

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Title: Use of a neoprene binding to reduce giant omphaloceles followed by delayed closure.

Authors: Barbara Lelj-Garolla MD, PhD [1,2], Lorena Campbell MSc OT [2], Jaideep Kanungo MD[2,3], Naomi Yoshida MD[3,4,5] .
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Background: Omphaloceles occur in about 1 in 5,000 births and are the second most common congenital abdominal wall defects. Repair remains a surgeon's preference with early closure only attempted for small to medium omphaloceles, while delayed closure is used for giant omphaloceles. In recent years novel techniques that aim at reducing the disproportion between the abdominal cavity and the volume of the extra abdominal viscera have been described to manage giant omphaloceles.

Although less commonly associated with genetic abnormalities, giant omphaloceles are associated with adverse neurodevelopmental outcome at 2 years. In addition to gestational age, birth weight, associated malformation, resuscitation and hypoxia, other factors including prolonged stay in the neonatal intensive care unit (NICU), time on ventilation, infections, and delayed establishment of enteral nutrition are likely contributory factors.

Objective: We describe two cases of giant omphalocele treated with a neoprene binding that allowed for gradual reduction of the abdominal contents and complete fascia closure. We included a survey of parental satisfaction.

Methods: Between 2015 and 2020 we cared for two newborns with giant omphaloceles. Gestational ages were 37+4 and 36 weeks and average birthweight was 2.56kg. Prior to complete fascia closure, omphaloceles were reduced in the abdomen with slow continuous pressure from a custom-made neoprene binding while taking advantage of the natural growth of infants. The binding also provided a protective barrier. The infants did not require sedation, were orally fed and developed normally. In addition, a survey was sent to assess parent satisfaction.

Conclusions: All infants had delayed primary closure with no patch or repeat surgery. Time to closure was 47 and 102 days respectively. Infants were discharged home 12 and 11 days post-operatively without complication. Infants did not require intubation or sedation and were fed orally throughout their stay. Surveys indicated positive parental view and minimal long-term consequences to the families and the infants that have normal development.

Our neoprene binding is cheap and can be custom made to fit each infant size and the omphalocele specific dimensions. It allows for serial reduction of the omphalocele while allowing for normal infant development, oral feeding, avoids anesthesia, and loss of fascial margin integrity. In addition, the binding can be adjusted in response to infant physiology. Families were very satisfied with the procedure and outcome.

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Title: After ASCENDE-RT: Outcomes of Androgen Deprivation, External Beam Radiation and LDR Brachytherapy Boost for High-Tier Intermediate and High Risk Prostate Cancer Treated at BC Cancer Kelowna
Authors: Jack Zheng, Francois Bachand, Ross Halperin, David Kim, David Petrik, and Juanita Crook
Affiliations: Radiation Oncology (UBC Okanagan/BC Cancer Kelowna)
Background: The 2017 publication of the ASCENDE-RT Trial demonstrated the efficacy of trimodality treatment in high-risk prostate cancer patients. Despite superior biochemical progression-free survival (b-PFS), the treatment was associated with higher GI and GU toxicities compared to external beam alone.
Objective: We analyzed patients treated in a similar manner in Kelowna in the years following accrual to ASCENDE-RT to see if outcomes and toxicity rates remain comparable outside a clinical trial selected population.
Methods: 99 consecutive patients treated with EBRT and LDR boost between 2010 and 2016 at BC Cancer Kelowna were reviewed. Survival analysis was conducted using Kaplan Meier Estimate. IPSS scores were patient reported. GI and GU toxicities were graded per the LENT-SOMA Scale.
Results: There were 42 high-tier intermediate risk and 57 high risk prostate cancer patients. Median follow up was 6.1 years (1.9-9.8 years). 81% received ADT for a mean duration of 11.7 months (IQR = 9.75-12). 12 patients developed biochemical failure with 5 and 8 years b-PFS of 89% and 85%. Median PSA at 4 years was 0.05 (IQR = 0.02-0.1). Mean IPSS decreased by 0.4 at 3 years from baseline but was the same at 5 years. Cumulative late Grade 2 and Grade 3 GU toxicity rates were 4% and 3% while the respective GI toxicity rates were 3% and 1%. The urethral stricture rate was 3%.
Conclusions: EBRT with LDR boost continues to demonstrate excellent b-PFS in both high-tier intermediate risk and high risk prostate cancer patients. Unlike reported results for ASCENDE-RT, late GU and GI toxicities along with urethral stricture rates were extremely low with >5 years of median follow up.
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Title: Childcare support in the cancer patient population: defining the need from the healthcare provider perspective.
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2Department of Radiation Oncology, BC Cancer Vancouver Centre
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Background: Approximately 20% of newly diagnosed cancer patients are between the typical parenting ages of 20 and 54, and so many of these patients are also the primary caregivers of children. Qualitative studies focusing on this demographic indicate that patients who are parents struggle to balance their own care needs with those of their children, but to date, no research has formally evaluated the need for on-site childcare services at cancer centers.
Objective: This study aims to explore the need for childcare support for cancer patients from the perspective of healthcare professionals providing care at a major Canadian cancer center.
Methods: Between May and April 2021, healthcare providers at one major Canadian cancer center were invited to partake in semi-structured interviews. The interview guide was developed through consultation with a multidisciplinary team and aimed to elicit the perspectives of healthcare providers on the importance and potential benefits of childcare services for their patients. Specific questions were also designed to explore what might constitute optimal childcare solutions for patients, and how cancer centers and healthcare providers could help to address this need. Interview transcript data was interpreted using thematic analysis.
Conclusions: Semi-structured telephone interviews were conducted with 28 healthcare professionals providing care at a major Canadian cancer center between April and May 2021, including medical, surgical, and radiation oncologists, psychiatrists, general practitioners, registered nurses, radiation therapists, and social workers. Managing childcare responsibilities was described as challenging for patients, and the introduction of childcare services for patients on-site at cancer centers was seen as a way to reduce emotional and financial stress. Other identified benefits of introducing childcare support services for patients included increased system efficiency, improved treatment compliance, increased trust in providers and cancer centers, and additional emotional support for the children of patients.
These results indicate that childcare issues are broadly impactful for parents battling cancer, and that providing childcare support for these patients could be highly beneficial from both a medical and social perspective. As such, these findings suggest that cancer centers could consider the implementation of childcare support services to provide a more patient-centered approach to care.
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Title: Balloon Dilation of the Paediatric Eustachian Tube: A Systematic Review and Meta-Analysis
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Background: Obstructive eustachian tube dysfunction (OETD) is one of three subtypes of Eustachian tube (ET) dysfunction that is most commonly discussed in the Otology literature due to the deleterious effects that it can have on the health of the middle ear (ME). OETD leads to persistent inflammation and the effusions that can develop create changes in the ventilation pathways of the ME as well as degradation within the tympanic membrane (TM). These alterations are likely the precursors to retraction pocket (RP) formation and subsequent acquired cholesteatoma as well as other ME pathologies. Balloon dilation of the ET (BDET) is one of the few options for treatment as no medical interventions have been shown to be useful in treating OETD. BDET was initially introduced in 2010 and a recent systematic review and meta-analysis has summarized much of the experimental data available since its inception; however, this article only includes adults. While the prevalence of ETD in adults is estimated to be between 1-5%, the prevalence in children is significantly higher, peaking at 18% in 5- year-olds. The exposure to this chronic inflammatory state from a young age can cause persistent weakness in the TM

that eventually could lead to the formation of a retraction pocket and possible cholesteatoma as an older child, adolescent, or adult, even without further episodes of inflammation.
Objective: The objective of this study was to complete a systematic review of the literature available on balloon dilation of the pediatric ET to determine whether this was an effective and safe intervention for reducing symptoms of OETD and improving middle ear function. From the studies included a meta- analysis was also completed.
Methods: A systematic literature search was performed up to October 1, 2020. Inclusion criteria were: BDET was the primary intervention; the population studied needed to be pediatric, defined as patients
<17; and the papers needed to include at least one of the outcomes of interest, which were, tympanometry data, otoscopy findings, audiometry data, Valsalva maneuvers, and complication rate. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was used as the writing guideline for this systematic review. A meta-analysis was completed for all outcomes with sufficient data from the included papers.
A total of 7 studies were identified and the total number of patients from the included studies for which quantitative data was available was 329 and in total 571 ears received BDET. Only two outcomes of interest were included in enough papers to warrant a meta-analysis. For tympanometry, the increase in type A tympanograms was 53.8% while the decrease in type B and C tympanograms was 42.0% and 12.0%, respectively. These values were all significant (p-values </= 0.0001). A meta-analysis of proportions was completed for complications and the rates of major and minor complications were found to be 0.3% (0.04-2.12%, 95% CI) and 2.74% (1.43-5.17%, 95% CI), respectively. Qualitative analyses were done for hearing, otoscopy, and Valsavla results, and all showed improvement post- treatment.
Conclusions: BDET is a safe and effective technique for treating and improving the sequelae from OETD in children. However, there is currently no evidence that this will reduce the rate of future complications, such as the formation of retraction pockets and cholesteatoma, and further work needs to be completed to determine which patients this should be offered to over conventional management.
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Title: Adherence to the American Thyroid Association Guidelines in the Management of Differentiated Thyroid Cancer: Impact on Survival Outcomes
Authors: Aria Shokoohi[1], Cheryl Ho[2,3], Sam M. Wiseman[3, 4], George Sexsmith[3,5], Jonn Wu[1,3], Sabrina Gill[3,6], Adam White[3,6], Eitan Prisman[3,7], Sarah Hamilton[1,3], Eric Tran[1,3], Eric Berthelet[1,3]
Affiliations: [1]Radiation Oncology, BC Cancer, Vancouver, BC; [2]Medical Oncology, BC Cancer, Vancouver, BC; [3]Faculty of Medicine, University of British Columbia, Vancouver, BC; [4]General Surgery, St. Paul's Hospital, Vancouver, BC; [5]Nuclear Medicine, St. Paul's Hospital, Vancouver, BC; [6]Endocrinology, St. Paul's Hospital, Vancouver, BC; [7]Otolaryngology, Vancouver General Hospital, Vancouver, BC
Background: The degree of surgical intervention needed for low-risk disease to managing high-risk differentiated thyroid cancer (DTC) with radioactive iodine (RAI) and/or external beam radiotherapy (EBRT) remains controversial.
Objective: The study objectives were to evaluate practice adherence to the primary management of DTC in accordance with the 2009 American Thyroid Association (ATA) guidelines and the impact on patients' outcomes.
Methods: A retrospective review of all DTC patients referred to our institution between 2009 and 2013 was conducted. Baseline characteristics, upfront surgical management, and use of adjuvant RAI and EBRT were collected. Disease management was assessed for adherence to the 2009 ATA guidelines.
Overall survival (OS) and cancer-specific survival (CSS) were estimated using the Kaplan-Meier method and compared with the log rank test.
Results: The cohort consisted of 1091 patients diagnosed with DTC during the study period (~65% of all diagnoses of DTC in British Columbia). Baseline characteristics: median age at diagnosis 50 years, female sex 73%, histology; papillary 91%, follicular 7%, hurthle cell 2%. Stage at presentation using the AJCC 7th edition was: I 58%, II 8%, III 21%, and IV 13%. In total, 104 patients (10%) received care that was inconsistent with the ATA guidelines. Five-year outcomes for management consistent with guideline recommended initial surgery +/- central compartment neck dissection versus non-adherence was OS 94% versus 85% (p<0.001) and CSS 98% versus 90% (p<0.001). Five-year outcomes for guideline recommended adjuvant RAI versus non-adherence was OS 94% versus 63% (p<0.001) and CSS 97% versus 85% (p<0.05). Five-year outcomes for guideline recommended radical EBRT versus non- adherence was OS 94% versus 74% (p<0.001) and CSS 97% versus 80% (p<0.001).
Conclusions: The majority of patients (90%) received appropriate care aligned with the ATA guidelines. In our population-based cohort, older age and male were factors associated with increased likelihood of receiving non-adherent care. Discordant care in each modality resulted in compromised OS and CSS, suggesting that more rigorous efforts should be made to adhere to the guidelines in order to improve survival for DTC patients.
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Title: Patients awaiting mastectomy report increased depression, anxiety, and decreased Quality of Life compared to patients awaiting lumpectomy for treatment of breast cancer.
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Background: There is a trend to increasing mastectomy (TM) for treatment of breast cancer despite studies demonstrating equivalent survival and better postoperative outcomes with lumpectomy (PM). There is a need to better understand the constellation of physical and mental health conditions patients face in the preoperative period.

Objective: The objective of this research is to measure aspects of patient's preoperative mental health and identify differences in between patients scheduled for TM and PM.
Methods: This study was based on a prospectively recruited cohort of consecutive patients scheduled for breast cancer surgery at our institution between April 2016 and July 2020. Preoperatively, participants completed a survey which included the Patient Health Questionnaire (PHQ-9) for depression, the General Anxiety Disorder-7 (GAD-7) for anxiety, the pain intensity (P), interference with enjoyment of life (E), and interference with general activity (G), known as the PEG, for pain and the EQ-5D(5L) for health status. Participants also reported their chronic health conditions. Scores were calculated for each instrument and compared for TM and PM.
Conclusions: The overall response rate among all eligible patients was 31% with 667 participants. The average age was 59 years. The most common comorbidities were hypertension (27%), arthritis (24%) and depression (13%.) Among participants, 477 were scheduled for PM (71.5%) and 190 were scheduled for TM (28.5%.)
TM patients reported more severe symptoms of anxio-depressive disorders: with higher levels of depression (5.3 versus 4.2; $p < 0.01$) and anxiety (5.7 vs 3.9; $p < 0.01$.) There were no differences in pain. Participants scheduled for PM reported high health status compared to participants scheduled for TM (75.0 vs 70.7; $p < 0.01$.)
Patients scheduled for TM reported more severe symptoms of depression and anxiety than those scheduled for PM. This information will be useful when counselling patients about surgical options. Preoperative referral to mental health providers may offer an opportunity to enhance perioperative care.
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Title: Variability in Post Operative Management of Developmental Dysplasia of the Hip: A Surgeon's Survey
Authors: Andrew D Pauls[1], Akshdeep Sandhu[2], Nicole Banting[3], Kishore Mulpuri[3], IHD Study Group, Emily K Schaeffer[3]
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Background: Developmental Dysplasia of the Hip (DDH) is the most common pediatric hip condition, with 1-3% of all newborns diagnosed at birth. It consists of a spectrum of hip abnormalities that range from mild hip instability to severely dislocated hips. Currently, it is not known if there is variability amongst pediatric orthopaedic surgeons regarding treatment and post-operative management of DDH.
Objective: The main objectives of this project are to investigate the variation in post-operative management of DDH between surgeons, and to develop a consensus treatment protocol for post- operative management of patient's with DDH.
Methods: Using REDCap, survey questionnaires were sent to pediatric orthopaedic surgeons who treated patients with DDH. We received 48 responses from surgeons practicing worldwide. The survey questionnaire includes sections of quantitative and qualitative questions regarding the surgeon's imaging choice, procedural decisions, and case-specific questions. The main variables collected were age range for procedure, spica cast usage, type of spica cast, angle of flexion, angle of abduction, spica cast replacement, if immobilization was necessary, and the length of immobilization.
Results: For a closed reduction, both unilateral (uni) and bilateral (bl) procedures appear to have similar uniformity regarding age range choice (uni – 6 mths-1yr: 90.5%, n=38; bl – 6mths-1yr: 88.1%, n=37), use of spica cast "all of the time" (uni: 90.5%, n=38; bl: 92.9%, n=39), spica cast change (uni: 76.2%, n=32; bl: 78.0%, n=32), and choosing to immobilize post-spica (uni: 83.3%, n=35; 85.4%, n=35). There was similar variability for both closed unilateral and bilateral reduction procedures regarding flexion angle (uni – median: 90°, range: 85°, n=38; bl – median: 90°, range: 85°, n=38), abduction angle (uni – median: 52.5°, range: 47.5°, n=38; bl – 52.5°, range: 45°, n=38) and full-time immobilization length (uni – median weeks: 12, range: 20, n=25; bl – median weeks: 12, range: 22, n=27). For an open reduction both unilateral and bilateral procedures appear to have similar uniformity regarding anterior-approach age range, medial-approach age range, use of spica cast "all of the time" (uni: 97.2%, n=35; bl: 93.8%, n=30). There was similar variability for both unilateral and bilateral open reduction regarding flexion angle (uni
– median: 45°, range: 105°, n=35; bl – 45°, range: 100°, n=30), abduction angle (uni – median: 45°, range: 55°, n=36; bl – 45°, range: 50°, n=31), spica cast change (uni: 41.7%, n=15; bl: 48.4%, n=15), and full-time immobilization length (uni – median weeks: 12, range: 24, n=21; bl – median weeks: 12, range: 23, n=17). In the bilateral open reduction anterior approach, there appears to be variability amongst surgeons regarding operating in a single stage (40.0%, n=10) versus a staged approach (60.0%, n=15).
Finally, there appears to be variability amongst surgeons' preference for both unilateral and bilateral open reduction osteotomy procedures.
Conclusions: This survey provides quantifiable data regarding variability in post-operative management of DDH that could foster discussion amongst surgeons and encourage development of a DDH treatment algorithm.
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Title: Virtual Surgical Planning in Maxillary Reconstruction: A Systematic Review
Authors: Teffran Chan, Cai Long, Eitan Prisman
Affiliations: Otolaryngology – Head and Neck Surgery
Introduction: Surgical ablation of head and cancers frequently results in significant functional and form impairments in patients. As such, excellent surgical free tissue transfer reconstructive techniques are imperative to reducing morbidity of surgical cancer treatments. Traditionally, reconstructions have been performed based on surgeon experience and expertise through free hand surgery (FHS). Recently, virtual surgical planning (VSP) has become readily accessible whereby 3D digital reconstructions of patient's anatomy is created by importing CT digital imaging and communications in medicine (DICOM) data into software. This technology allows surgeons to pre-operatively optimize reconstructions to reduce ischemia time, improve boney apposition, and reduce length of admission.
The usage VSP has become common practice in mandibular reconstruction, however, maxillary reconstruction is more technically challenging and is likely to benefit from VSP.
Objective: In this study, we aim to synthesize utilization and surgical outcome data of VSP in osteocutaneous reconstruction of all maxillary defects published in case reports, case series, randomized or non-randomized control trials.

Methods: All case report, case series, cohort studies, uncontrolled intervention studies, randomized or non-randomized controlled trials published in English or Chinese between year 2000 to 2020 in Embase, Medline, or Web of Science, were included in our study. Four hundred and fourteen articles were screened revealing 15 fulfilling all criteria for our qualitative synthesis. The Joanne Brigg's Institute checklist for critical appraisal was completed by two authors with subsequent data extraction.
Conclusions: Key intraoperative metrics assessed included ischemia time, hospitalization time, and gross operative time. Seven of fifteen articles reported intraoperative factors, two of which, had direct cohort comparison between FHS and VSP. One of the two article revealed statistically superior intraoperative metrics, favoring VSP, whilst the other showed no difference. Financial assessment comparing gross total cost was not reported in any study. Functional outcomes including speech, aesthetic, and bite force was not tracked or reported by majority of the studies. Standardized post operative functional questionnaires were only utilized by one article.
An attempt to synthesize data in the literature revealed substantially heterogenous evaluation metrics, resulting in difficulty intra-institutional comparisons difficult. In addition, no randomized control trial has been performed to substantiate the benefit of VSP. Future steps involve developing a reporting inventory to track performance metrics of FHS and VSP so a future randomized trial can be performed to evaluate efficacy.
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Title: Early Flow Testing of an Innovative Axial Flow Left Ventricular Assist Device
Authors: Logan T. J. Atkinson[1], Rosaire Mongrain[2], Renzo Cecere[3]
Affilations: 1: UBC Cardiac Surgery, McGill Experimental Surgery; 2: McGill University Mechanical Engineering; 3: McGill University Health Center
Introduction: Heart Failure is a clinical entity of global concerns and can be caused by a multitude of disorders that effect the structure or function of the heart. There have been many medical and surgical advances to improve the mortality and morbidity of this disease. One treatment option in end stage heart failure is the insertion of a left ventricular assist device, providing continuous forward blood flow when the heart cannot maintain the output on its own. Current models focus predominantly on centripetal pumps which use rotational motion to force the fluid radially and through the output channel. This mechanism produces a lot of contact with the red cells and exerts substantial levels of strain much higher than physiologic levels. The proposed design is to return to an axial flow, using rotational motion to force the fluid in a more laminar flow. Other concerns with any device in the blood stream are the possibility of thrombosis, both from a device failure or from an embolic event perspective.
Objective: The goal is to achieve a novel configuration on an existing scaffold to mitigate some of these risks of current devices. The new design will have a blade conformation change with more compact edges rotating on an exterior shroud. It will leave a hollow central corridor thus reducing contact with blood and hopefully diminishing the amount of hemolysis, as well as thrombotic events. Proof of concept has already been established by previous teams through computation fluid dynamics simulations as well as through the study of the effects of both the viscosity and ellipsoid nature of the cells to determine best design features.
Methods: Because this is a proposed project, there are limited results beyond what the developing team has shown with software. Therefore, the next stage is to develop prototypes with SLA 3D printing and begin testing the efficacy of the device with physiologic fluids and pressures. There has been one series of prototypes developed previously that adjusted the blade length for its variable. At this time, testing data has not been compiled for its efficacy. Other variable parameters that can be assessed to optimize the product in the future include; blade angulation, blade thickness and leading / trailing edge geometry. This in vitro testing is important for future directions as most computational models are difficult to calculate given the non- Newtonian nature of blood as well as the added complication of the existing contraction of a heart leading to pulsatile variation in flow.
Conclusion: This testing and optimization will eventually lead to determining the degree of hemolysis and, comparing with current assist device designs, hoping to ensure non-inferiority. Should this design proceed as expected, there could be an opening for implementation into current market as an additional device for the treatment for heart failure.
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Title: prediction of massive transfusion with the revised assessment of bleeding and transfusion (rabt) score at canadian level i trauma centers
Authors: Karan D'Souza MD MPH MM[1,2], Matthew Norman BSc[2], Adam Green MSc BHSc[1], Matthew Yan[2,3], Jacqueline Trudeau MD PhD[2,4], Michelle Wong[2,3], Andrew Shih MD MSc[2,3], Philip Dawe, CD MD[1,2]
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Introduction: The use of massive transfusion protocols (MTP) to prevent trauma deaths due to exsanguination and hemorrhagic shock remains a foundational life-saving intervention. Scoring systems have been developed to predict and identify severely injured patients needing MTPs. The Revised Assessment of Bleeding and Transfusion (RABT) score previously outperformed the Assessment of Blood Consumption (ABC) score. However, given the lower frequency of penetrating mechanisms among Canadian trauma patients, we aimed to validate the RABT score for use in our local context.
Objectives: The aim of our study will test the feasibility and validity of utilizing the RABT score in comparison to the ABC score and SI to assess the need for MTP activation in severely injured trauma patients at a two major Level I trauma academic centers in British Columbia, Canada.
Methods: We performed a 5-year (2015-2020) analysis of adult trauma patients (age ≥18) who met criteria for a trauma-team activation at two Level I trauma centers. A RABT score ≥ 2 was used to predict MTP using two definitions: Research (≥10 units pRBCs/ 24h) and Clinical (≥3 units pRBCs/ first hour of admission). The sensitivity, specificity, and the area under the receiver operating characteristic curve (AUROC) was calculated to assess and compare the scoring systems (RABT, ABC, and Shock Index [SI]).

Results: We analyzed 327 patients with a mean age of 44.9 ± 19.2 years and a median injury severity score (ISS) of 29 [18,38]. For both research and clinical definitions for MTP, the RABT score had higher sensitivity but lower specificity than the ABC score and SI (Table 1). Using the research definition, the AUROC for the RABT score, 0.679, was not significantly higher than that of the ABC score, 0.645, or SI, 0.667; similar results were demonstrated using the clinical definition.
Conclusion: The RABT score is a valid tool for predicting the need for MTPs but performed similarly when compared to the ABC score or SI in our Canadian trauma population. The simple design of all scoring systems can be easily implemented and can objectively aid clinician decision-making to accurately mobilize time-sensitive resources.
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Title: Psychological and workplace-related effects of providing surgical care during the covid-19 pandemic in British Columbia, canada
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Introduction: The COVID-19 pandemic has been an uncertain, challenging time that placed numerous strains on the Canadian healthcare system. A crucial yet sometimes overlooked aspect of this has been the mental health impact on health care workers. Surgeons, in particular, have faced unique stressors due to the cancellation of elective procedures, uncertainty regarding future management of urgent patient conditions such as oncologic operative procedures, and fear of infectious transmission to family and friends due to exposure from aerosol-generating procedures.
Objective: The purpose was to evaluate the impact of the initial phase of the COVID-19 pandemic on general surgeons' mental health across British Columbia (BC), Canada.
Methods: An online survey was distributed to BC general surgeons to gather demographic and mental health data related to the pandemic period, including two validated burnout and psychological distress tools, the abbreviated Maslach Burnout Inventory (aMBI) and the Kessler psychological distress scale (K10).
Results: Sixty-three of 198 surgeons (32%) across BC responded to the survey; 44% and 59% felt that the pandemic negatively impacted their job performance and personal relationships outside the hospital, respectively. 64% felt more stress or anxiety due to decreased access to operating rooms. From the aMBI results, 32.7% of surgeons felt emotionally exhausted from work, and the average K10 score was consistent with moderate psychological distress.
Conclusions: The COVID-19 pandemic has negatively impacted general surgeons' mental health across BC, both professionally and personally. This should be acknowledged hospital leaders with specific efforts to mitigate the short and long-term impacts on surgeons' wellbeing.
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