



2021 VIRTUAL RESIDENT RESEARCH DAY DEPARTMENT OF SURGERY



UNIVERSITY OF
SASKATCHEWAN



Saskatchewan
Health Authority

*“Discovery consists of seeing what everybody has seen
and thinking what nobody has thought.”*

**- Albert Szent-Gyorgi
Nobel Laureate Physiology & Medicine
1937**



Dr. Ivar Mendez

Fred H. Wigmore
Professor and
Provincial Head

Department of Surgery

University of
Saskatchewan &
Saskatchewan Health
Authority

As 2021 comes to a close, Saskatchewan has been battling the fourth wave of the COVID-19 pandemic. We are feeling the pressures of the COVID-19 delta variant in our in-patient and ICU capacity. I am proud of the resilience of the Department of Surgery members to maintain exemplary surgical care and keep up the research, education and quality improvement productivity under these challenging circumstances.

After the initial waves of the pandemic, research through the department was re-initiated under strict mitigation guidelines to avoid COVID transmission. The research productivity has ramped up since then and our faculty and residents successfully balanced the clinical challenges of the pandemic with their research endeavors. This 2021 Resident Research Day is a testimony of their commitment to research.

The Research Committee under the leadership of Dr. Daryl Fourney, has continued to work hard throughout this time in promoting and supporting research at all levels. Particular attention has been put to new faculty support and resident research in all divisions. The Committee has also articulated a strategic framework for enhancing research in the department. The leadership of the department is fully committed to supporting this strategy.

Dr. Charles Fisher, Professor & Head of the combined Neurosurgical and Orthopedic Spine Program at the Vancouver General Hospital and the University of British Columbia, is our keynote speaker. The Research Committee has selected 14 platform presentations and the day promises to be an exciting one as we celebrate research in our department.

COVID-19 continues to challenge resources at all levels in our health system and has taught us once again how important trustworthy medical evidence is needed for Canada and the world. Despite the pandemic, research output from our Department has continued to grow, with the number of peer-reviewed publications at an all-time high.

In addition to funding, there are many other challenges that affect surgical research productivity such as clinical demands, unpredictable surgical schedules due to COVID-19, limited operating room resources, administrative demands, and an aging population with complex clinical needs. In September, I addressed the Department at Grand Rounds to outline a new direction to facilitate research infrastructure at the Divisional level. This is starting with reviews of each Division to identify supports for sustainable research programs. We are also formalizing mentoring programs for developing surgeon scientists.

Today's program is a celebration of the research successes of our residents and medical students. It will showcase work across multiple specialties. I wish to thank all the presenters, judges and session chairs for their valuable contributions. I especially want to thank Dr. Charles Fisher from the University of British Columbia for joining us as the invited guest. I would also like to thank members of the Surgery Research Committee and the support staff within the Department of Surgery Research and Communications for coordinating and promoting a truly superb program. Finally, I wish to thank all of you for attending, listening, and contributing to surgical research and innovation in Saskatchewan.



Dr. Daryl Fourney

Director of Research

Department of Surgery &
Division of Neurosurgery

Professor

College of Medicine,
University of Saskatchewan

2020 Award Recipients

Surgery Resident Research Day

Platform Presentations:

Podium Presentation Award 1st Place

Kristen Marciniuk

Podium Presentation Award 2nd Place

Kristi Billard

Podium Presentation Award 3rd Place

Amit Persad

Resident Research Publication Award:

Amit Persad

Undergraduate Medical Student Awards:

Dash-Reed Research Award

Emmitt Hayes

2019 Award Recipients

Surgery Resident Research Day

Platform Presentations:

Podium Presentation Award 1st Place

Paul Kulyk

Podium Presentation Award 2nd Place

Sarah McLaren

Podium Presentation Award 3rd Place

Amit Persad

Kvinlaug Surgical Foundations Research Award

Emily Chan

Resident Research Publication Award:

Uzair Ahmed

Undergraduate Medical Student Awards:

Dash-Reed Research Award

Julia Newton

2021

DEPARTMENT OF SURGERY

VIRTUAL RESIDENT RESEARCH DAY

November 23, 2021

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INTRODUCTION

Department of Surgery
Virtual Resident Research Day

08:00 - 08:10

OPENING REMARKS

Dr. Daryl Fourney
Director of Research & Professor
Department of Surgery & Division of Neurosurgery

WELCOME

Dr. Ivar Mendez
Provincial Head & Fred H. Wigmore Professor
Department of Surgery

SESSION I

Moderator: Dr. Paul Mick

08:10 - 09:30

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BREAK 09:30 - 09:40

Prior to Keynote Speaker:
RESEARCH DAY GROUP IMAGE will be taken, all participants will be asked to turn video-cameras on

KEYNOTE SPEAKER

Department of Surgery
Virtual Resident Research Day

09:40 - 10:40

FIVE *WAYS* TO AVOID EPIC RESEARCH FAILURES AS AN *ACADEMIC SURGEON*

Dr. Charles Fisher

Professor & Head of
Combined Neurosurgical and Orthopaedic Spine Program
Vancouver General Hospital and University of British Columbia

Dr. Fisher is Professor and Head of the Combined Neurosurgical & Orthopaedic Spine Program at Vancouver General Hospital and the University of British Columbia. His practice is confined to adult spine surgery with subspecialty clinical interests in trauma and oncology. He has a Masters Degree in Health Care and Epidemiology and is the former President of the Canadian Spine Society. In 2019 Dr. Fisher was awarded the North American Spine Society's Leon Wiltse Award, recognizing excellence in leadership and clinical research in spine care.

Dr. Fisher has special research interests in spine trauma, oncology and evidence-based medicine. For the past 8 years he has been Chairman of the AO Knowledge Forum Tumour, an international group of spine oncology surgeon thought leaders committed to advancing the understanding of spine oncology management through education and multi-center research. He has now stepped down to become chair of the AO Spine International Research Commission. Dr. Fisher was the lead author of the SINS classification for metastatic spine disease, now broadly adopted by both spine surgical and oncology disciplines.

Dr. Fisher chairs the steering committee for the Canadian Spine Outcomes and Research Network (CSORN); a multicenter research network and registry he initiated in 2013. Dr. Fisher contributes biannually to regular articles on Evidence Based Recommendations in Spine Surgery for the journal Spine.

Dr. Fisher has authored over 300 peer-reviewed publications and has co-edited 4 textbooks. He has been the special guest editor for two focus issues in Spine Oncology for the journal Spine. He formally sat on the Editorial Board of the Journal of Neurosurgery Spine and is an Associate Editor for the journal Spine. He is a regular guest lecturer at spinal events around the world and in 2013 and 2016 was honoured as one of the top 28 spine surgeons in North America.

Dr. Fisher attended UCLA on a soccer scholarship and graduated with honours degree in Kinesiology. He attended Dalhousie University Medical School, and completed his residency at the University of British Columbia. Dr. Fisher did a Spine Fellowship at the University of Western Ontario, in London. He is married to Carolyn, his wife of 30 years, and has 4 children, Zacharie, Charlotte, Anabelle and Olivia.



Dr. Charles Fisher

Professor & Head of
Combined Neurosurgical &
Orthopaedic Spine Program

Vancouver General
Hospital and University of
British Columbia

SESSION II

Moderator: Dr. Laura Sims
10:40 - 11:50

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CLOSING REMARKS 11:50 - 12:00

ACKNOWLEDGMENTS

The Department of Surgery would like to thank the following individuals for serving as judges and session moderators for the 2021 Virtual Resident Research Day.

JUDGES

Dr. Lauren Allen

Assistant Professor, Department of Surgery
Division of Orthopedic Surgery
College of Medicine, University of Saskatchewan

Dr. Francisco Cayabyab

Professor, Department of Surgery
Basic Surgical Research
College of Medicine, University of Saskatchewan

Dr. Peter Graham

Assistant Professor, Department of Surgery
Division of General Surgery
College of Medicine, University of Saskatchewan

Dr. David Kopriva

Clinical Associate Professor, Department of Surgery
Division of Vascular Surgery
College of Medicine, University of Saskatchewan

Dr. Kotoo Meguro

Associate Professor, Department of Surgery
Division of Neurosurgery
College of Medicine, University of Saskatchewan

MODERATORS

Dr. Paul Mick

Associate Professor, Department of Surgery
Division of Otolaryngology - Head & Neck Surgery
College of Medicine, University of Saskatchewan

Dr. Laura Sims

Assistant Professor, Department of Surgery
Division of Orthopedic Surgery
College of Medicine, University of Saskatchewan

2021

DEPARTMENT OF SURGERY

**VIRTUAL RESIDENT RESEARCH DAY
ABSTRACTS**

Remote surgical consultation in the time of COVID 19 - A patient oriented, mixed methods approach

Platform Presenter: Kyle Irving

Division of General Surgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Marissa Alarcon (Clinical Research Support Unit, University of Saskatchewan), Barbara Martin (Patient Partner SCPOR), Heather Dyck (Patient Partner SCPOR), Tracey Carr (College of Arts & Sciences, University of Saskatchewan), Gary Groot (Department of Surgery, University of Saskatchewan).

Rationale:

There has been a rapid shift in healthcare delivery over the past year in the setting of COVID-19 where virtual and remote consultations have replaced many face-to-face interactions. Our study gathered patients' perspectives on the advantages and disadvantages of this emerging method of healthcare delivery and determine how to optimize its use in the future of surgical care.

Methods:

Using a patient oriented mixed methods approach, we conducted forty-five telephone interviews with patients who had a virtual consultation with a general surgeon in Saskatoon, Saskatchewan, between the months of April and May 2020. The interviews contained both open and closed-ended questions. As research team members, two patient partners were involved in identifying priorities, developing the research question, designing research methods, analyzing data, and disseminating findings.

Results:

We established themes for both the advantages and disadvantages of remote consultation. The advantages were 'convenience', 'not having to take time off work', 'more time efficient', 'no need to travel', 'decreased burden on care givers', 'cost savings' and 'decreased exposure to pathogens'. The disadvantages were the 'inability to perform a physical exam', 'less personal', 'no previous relationship', 'receiving bad news', 'not given an appointment time', 'not prepared to ask questions', and 'issues with technology'. Participant age, geographical location or appointment type did not have significant effect on satisfaction or future willingness to use virtual care.

Conclusion:

Participants reported that virtual consultation is an effective and efficient way to deliver surgical care but is not appropriate for every situation.

Funding Sources:

Saskatchewan Centre for Patient-Oriented Research.

Does prolonged symptom duration influence surgical outcomes for cervical radiculopathy?

Platform Presenter: Nathan Baron

Undergraduate Medical Education
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Yanzhao (Alex) Cheng (Department of Surgery, University of Saskatchewan), Daryl Fourney (Department of Surgery, University of Saskatchewan).

Rationale:

Multiple studies have shown better outcomes for cervical radiculopathy when anterior cervical discectomy, fusion and plating (ACDFP) is performed within 6 months of symptom onset. In Canada, more than 50% of patients have symptoms longer than 2 years. The objective of this study was to determine if there remains benefit to earlier surgery in a Canadian cohort with longer average wait times.

Methods:

This is a retrospective chart review of consecutive patients who underwent single or two-level ACDFP for cervical radiculopathy due to spinal stenosis or disc herniation from May 1, 2012-May 1, 2018. Primary outcome measures: Neck Disability Index (NDI), visual analogue scale pain scores for arm and neck (VASneck, VASarm), EuroQol-5D (EQ-5D) quality of life pain scores.

Results:

We analyzed preoperative scores and compared to early outcomes (6-8 weeks) and late outcomes (18-24 months). The average preoperative symptom duration in the entire cohort was 37 months (range 0-250 months). We analyzed two groups: symptoms lasting 24 months or less (Group A) and symptoms lasting greater than 24 months (Group B). A total of 120 patients were included. There were no significant preoperative differences between groups. Group A patients reported less VAS neck pain at early follow-up ($p = 0.022$) and less NDI disability at late follow-up ($p = 0.039$).

Conclusion:

In a Canadian population with long wait times, there are still improved outcomes with earlier surgery. Patients with cervical radiculopathy for less than 24 months saw earlier relief of neck pain and reported less disability up to 2 years after ACDFP.

Funding Sources:

College of Medicine - Dean's Project.

Surgical outcomes for long head of the biceps surgery: An updated chart review

Platform Presenter: Pavlo Zerebecky

Undergraduate Medical Student
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Robert Downey (College of Medicine, University of Saskatchewan), Wyatt Tyndall (College of Medicine, University of Saskatchewan), Michelle McCarron (Research Department, Saskatchewan Health Authority), Aden Mah (College of Medicine, University of Saskatchewan), Jeremy Reed (Department of Surgery, University of Saskatchewan).

Rationale:

To understand which surgical management option provides the lowest chance of re-operation and most favourable outcomes in patients with pathology of the long head of biceps tendon (LHBT).

Methods:

511 patients underwent one of four tenotomy or three tenodesis techniques: Arthroscopic tenotomy (n=8), Arthroscopic shortening and tenotomy (n=46), Arthroscopic tenotomy with mini-open shortening (n=16), Arthroscopic tenotomy with mini-open shortening and biceps groove debridement (n=97), Arthroscopic tenotomy with mini-open tenodesis drawn in (n=21), Arthroscopic tenotomy with mini-open tenodesis pushed in (n=103), and Arthroscopic tenotomy with mini-open tenodesis pushed in with bicep groove debridement (n=34). A retrospective chart review determined if post-surgical intervention was required. Telephone interviews assessed patient satisfaction and subjective restriction in function following surgery.

Results:

Tenodesis patients (12%) were significantly more likely to require subsequent intervention than tenotomy patients (4.2%), $\chi^2_{21} = 6.687$, $p = .010$. Tenotomy patients were significantly more likely to re-gain pre-injury shoulder function compared to tenodesis. Both tenotomy and tenodesis patients reported being glad that the surgery was performed (90.4% vs. 93%) and that they would have the surgery again (88.6% vs. 90.4%).

Conclusion:

Overall, it appears that patients are satisfied with both procedures, but tenotomy leads to lower rates of re-operation and better functional outcomes.

Funding Sources:

University of Saskatchewan - Dean's Summer Research Program.

Looking at lesion severity in a mouse model of intracerebral hemorrhage

Platform Presenter: Nicole Pendleton

Division of Neurosurgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Nicole J. Sylvain (Department of Surgery, University of Saskatchewan), Huishu Hou (Department of Surgery, University of Saskatchewan), M. Jake Pushie (Department of Surgery, University of Saskatchewan), Michael E. Kelly (Department of Surgery, University of Saskatchewan), Lissa Peeling (Department of Surgery, University of Saskatchewan).

Rationale:

Intracerebral hemorrhage (ICH) is caused by the rupture of a blood vessel, resulting in bleeding into the brain. This type of stroke accounts for 12-15% of all strokes and is the most fatal type of stroke (40% mortality rate). ICH stroke presents a greater burden to survivors as 90% of ICH survivors have some degree of disability. Currently, there are no effective, proven treatments for these patients that provide good outcomes. Because of the poor patient outcomes, there is a clear need for identifying new treatments as well as establishing the efficacy of existing treatments. Mice are suitable models for studying human stroke because their brains share similar neuroanatomy and cerebrovascular structures. Mice also have the same clotting cascade and subsequent mechanism of brain damage as humans.

Methods:

Using previously described techniques we aim to establish a mouse model of ICH at the University of Saskatchewan. We will anesthetize them using isoflurane, and while anesthetized we will make a midline incision to access the bregma, using described coordinates we will mark and drill a burr hole. Then with the help of a navigation system we will instill collagenase to create the desired ICH. We observed them at a 1- 24-, 48- and 72hr mark post-stroke and scored for neurological deficits.

Results:

We currently have conducted 23 model trials. We have data on mice at 1-, 24, and 72 hr post stroke. We have observed and begun to analyze a lesion area that can be seen in H&E stained sections, which corresponds to areas of hemorrhage, as seen in unstained sections and adjacent sections imaged with Fourier Transform Infrared (FTIR) imaging.

Conclusion:

We have successfully established a mouse model of ICH at the University of Saskatchewan. We are currently conducting histology and synchrotron imaging of the established models.

Funding Sources:

Saskatchewan Health Research Foundation, Heart and Stroke Foundation, University of Saskatchewan College of Medicine.

Semi-recumbent patient positioning on hospital wards: A prospective look

Platform Presenter: Robert Downey

Undergraduate Medical Education
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Dylan Turner (Kinesiology, University of Regina), Pavlo Zerebecky (College of Medicine, University of Saskatchewan), Wyatt Tyndall (College of Medicine, University of Saskatchewan), Michelle McCarron (Research Department, Saskatchewan Health Authority), Jeremy Reed (Department of Surgery, University of Saskatchewan).

Rationale:

Poor respiratory function and low oxygen saturation are often cited as reasons for prolonged hospital stays and delays in the initiation or progression of treatment. It has been anecdotally noted by the senior author that patients are often “slumped” in their beds, with their pelvis distal to the crook of the mechanized bed, leaving them flexed across the abdomen, in a kyphotic posture. This slumped position limits lung volumes, increases the work of breathing, and compromises overall respiratory status.

Methods:

A visual assessment tool was created to classify position as good, fair, or poor. Data collection occurred in Saskatoon, on 12 different wards across 3 hospitals. Patient’s position was evaluated from an anterior and lateral vantage point. Data collection occurred 3x/week at 3 different time periods throughout the day. 20% of the data points were assessed by a second independent research student to evaluate the reliability of the visual assessment tool.

Results:

A total of 1047 patients fit the inclusion criteria and were included for analysis. 98 (9.4%) patients received a “poor” classification in one or both perspectives. Inter-rater reliability was calculated as “moderate” for lateral position, and “strong” for anterior position. The only significant difference was lateral position by ward type where patients on surgical wards were less likely to display poor lateral positioning than those on medical wards.

Conclusion:

Poor patient positioning was relatively uncommon (9.4%), but positioning could be optimized for some patients. Further research should evaluate the impact of poor positioning on patient outcomes.

Funding Sources:

College of Medicine Dean’s Research Projects.

Development and testing of a prototype mask to reduce aerosol production during upper gastrointestinal endoscopy: A randomized clinical trial

Platform Presenter: Williams Usama

Undergraduate Medical Education
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Gordie K. Kaban (Department of Surgery, University of Saskatchewan), Jeff Gu (Department of Surgery, University of Saskatchewan), Chris Bonokoski (Community Health and Epidemiology, University of Saskatchewan), Christian F. Rueda-Clausen (Department of Medicine, University of Saskatchewan/Prairie Cardiovascular Research Group).

Rationale:

Gastroscopy may be an aerosol-generating medical procedure that could result in airborne infections such as COVID-19 in health care personnel. We hypothesized that a mask worn by a patient during gastroscopy could reduce aerosol production. We designed and developed a novel mask for upper gastrointestinal endoscopy to mitigate the spread of aerosols.

Methods:

An N95 facemask was modified with a 3D printed component to incorporate a valve thereby allowing insertion of an endoscope. The final product was trialed in a simulation laboratory to confirm operation and compatibility of this novel device to currently available endoscopes. Ethics approval was obtained from the University of Saskatchewan. Health Canada approval was obtained for use of the device in a clinical trial. A total of 20 patients booked for elective gastroscopy were randomized 1:1 (standard care vs novel mask). Aerosols generated were recorded using a Kanomax 3910 portable particle sizer. Other anthropometric demographic, clinical parameters, characteristics of the procedure were obtained. Patient satisfaction and experience during the procedure were recorded.

Results:

There was a 50% increase in the production of small particles (0.1-0.5um) with the aerosol-reducing mask compared to control and no effect in the generation of large particles (0.3-10um) between both groups. All gastroscopies were able to be completed with use of the mask and no adverse events were encountered.

Conclusion:

The use of the novel aerosol mitigating device was well tolerated by patients. The expected mitigation of aerosol production was not demonstrated in this trial but did not result in any adverse events.

Funding Sources:

Office of the Vice Dean of Research, Respiratory Research Center - University of Saskatchewan.

The influence of pre-season versus in-season play on achilles tendon injuries in the NFL

Platform Presenter: Lauren Ready

Division of Orthopedic Surgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

NY Li (Department of Orthopaedic Surgery, Brown University), S Worobey (Wheaton College), N Lemme (Department of Orthopaedic Surgery, Brown University), DS Yang (Brown Medical School), J Yang (Department of Orthopaedics and Sports Medicine, University of Washington), M Krill (Department of Family Medicine, University of Iowa Sports Medicine), BD Owens (Department of Orthopaedic Surgery, Brown University).

Rationale:

A ruptured Achilles tendon (AT) can sideline a player for 6-12 months and reduce their power rankings by over 50%. Given a minimal amount of research on AT ruptures in the National Football League (NFL), the purpose of this project was to determine environmental and physiological risk factors for AT tears.

Methods:

NFL players with a diagnosed AT tear between 2009 and 2016 were the study population for this retrospective analysis. NFL injury data was collected from an established database comprised of publicly available information. Player profiles were employed to determine player and game statistics at time of injury.

Results:

Between 2009 and 2016, there were 101 documented AT tears. Sixty-four percent (65/101) occurred before the official season, including preseason games. Of the 36 that occurred in-season, 34 were during games. Twenty-nine percent (19/65) of the preseason tears occurred in rookie and 100% (36/36) of the in-season tears affected non-rookies. Of the rookies with AT ruptures, 42.11% returned to play in the NFL, while 62.20% of the non-rookies came back to partake in future seasons.

Conclusion:

This is the first article to specifically compare AT rupture rates in rookies and non-rookies. While previous studies have assessed risk factors for AT tears, there is a scarcity assessing the relationship between player experience and risk of injury. In this way, new NFL players were identified as an at-risk population for AT tears and a possible target for injury prevention.

Funding Sources:

None.

An epidemiological profile of pickleball athletes

Platform Presenter: Matthew Getzlaf

Division of Orthopedic Surgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Jason Shin (Department of Surgery, University of Saskatchewan).

Rationale:

Pickleball is a racquet sport played on a court combining elements of tennis, table tennis, and badminton. Pickleball tends to be a sport adopted by athletes later in life. With the growing popularity of pickleball, the number of injuries seen by orthopedic surgeons is increasing. However, because of lack of research in pickleball, there is a paucity of data regarding injury profiles in this sport.

Methods:

An online survey was administered to Canadian pickleball athletes from February 1 until March 31, 2021. Questionnaire including questions on demographics, sports participation, injuries, and treatment modalities were collected. Responses from 304 athletes were collected for the analysis. Univariate and Multivariate logistic regression analyses were performed.

Results:

The survey was completed by 304 pickleball athletes with a median age of 62.1, ranging from 28 to 78. 181 were female, and 123 were male. Overall, 78% of participants reported an injury in their pickleball career. Most athletes sustained soft tissue (71.0%) injuries. Other common types of injuries included fractures (7.9%), and lacerations (6.9%). Shoulder and knee injuries were the most common, each suffered by 31.9 % of injured athletes, followed by elbow (29.1%), ankle (25.9%), and foot (18.1%). 55% of injuries were sustained in the practice setting, with the other 45% being in competition. Athletes participating in other sports were at higher risk of sustaining an injury in pickleball (OR 4.58; P = 0.01). Injured athletes were most commonly treated with physical therapy (94.0%), while injections (13.8%) and surgery (10.9%) were less common.

Conclusion:

A high number of pickleball athletes reported sustaining an injury while playing the sport. Knee and shoulder injuries were most commonly reported followed by ankle and elbow injuries. Physical therapy was the most commonly sought treatment modality. A history of playing other sports in addition to pickleball was found to increase the odds of injury. Participants in pickleball should be informed about risk of injury and educated regarding appropriate precautions.

Funding Sources:

None.

Comparison between post-operative pain control using TAP blocks with and without the administration of perineural dexamethasone

Platform Presenter: Zarrukh Baig

Division of General Surgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Moayad Alturkistani (College of Medicine, University of Saskatchewan), Nawaf Abu-Omar (Department of Surgery, University of Saskatchewan), Dilip Gill (Department of Surgery, University of Saskatchewan), Nathan Ginther (Department of Surgery, University of Saskatchewan).

Rationale:

The transversus abdominis plane (TAP) block is a peripheral nerve block that has been shown to significantly reduce postoperative opioid requirements. The use of dexamethasone in conjunction with peripheral nerve blocks has been proven to be an effective adjunct, however, its use remains off-label. Furthermore, no apparent evidence is present to prove the benefit of dexamethasone use with TAP blocks in the setting of minimally invasive colorectal surgery.

Methods:

To assess pain control in the first 48 post-operative hours after minimally invasive colorectal surgery in patients who received laparoscopically placed TAP blocks with and without the administration of perineural dexamethasone. Sixty patients undergoing laparoscopic colorectal surgery were included in this retrospective cohort study. Patients were allocated into 2 groups. Group 1 (TAP) received bilateral TAP blocks using 0.25% bupivacaine with epinephrine and Group 2 (TAP-D) received bilateral TAP blocks using 0.25% bupivacaine with epinephrine in combination with dexamethasone. Patient demographics, wound class, opioid use in the post anesthetic care unit, at 24h, 48h, use of patient-controlled analgesia (PCA) and length of stay were recorded.

Results:

The study included 30 patients in the TAP block group and 26 patients in the TAP-D group. Four patients were excluded due to chronic opioid use and conversion to open surgery. There were no significant differences between the characteristics of both groups, including surgical indication and technique. There was a significant difference in PCA use between the two groups, with the TAP-D group having a 38% greater PCA use. Univariate analysis revealed no significant difference in the total opioid use in patients with TAP-D compared to TAP ($P=0.35$). Through multivariate analysis and adjusting for 10 confounders, there was no significant difference in opioid use in the first 48 hours between the two groups ($P=0.242$). Adjustment for PCA use indicated a trend towards lower opioid use in the TAP-D group, however, without significance.

Conclusion:

Transversus abdominis plane blocks with perineural dexamethasone did not significantly improve opioid use in the first 48 hours post laparoscopic colorectal surgery. A trend towards lower opioid use was evident when PCA use was controlled for. Therefore, a larger sample size with standardized PCA use can signify the benefit of adding perineural dexamethasone to conventional TAP blocks in the setting of minimally invasive colorectal surgery.

Funding Sources:

None.

Three-dimensional geometric lesion characteristics differentiate multiple sclerosis from nonspecific white matter disease

Platform Presenter: Braeden D. Newton

Division of Neurosurgery, Department of Surgery
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

UT Southwestern Medical Center, Department of Neurology & Neurotherapeutics, Neurotherapeutics, Neuroinnovation Program, Multiple Sclerosis & Neuroimmunology Imaging Program, Clinical Center for Multiple Sclerosis (Dallas): Katy Wright, Mandy D. Winkler, Darin T. Okuda; University of Genoa, Department of Health Sciences (DISSAL), (Genoa, Italy): Francesca Bovis, Maria Pia Sormani; Advanced Imaging Research Center, UT Southwestern Medical Center (Dallas, TX): Masaya Takahashi, Ivan E. Dimitrov; Philips Medical Systems (Cleveland, OH) Ivan E. Dimitrov; UT Southwestern Medical Center, Department of Radiology (Dallas, TX): Marco C. Pinho.

Rationale:

There is a need to further improve the ability to differentiate multiple sclerosis (MS) from other disease etiologies. We demonstrate the value of 3-dimensional (3D) geometric lesion characteristics to differentiate disease etiology.

Methods:

3D brain MRI studies were performed on MS and nonspecific white matter (NSWM) patients. Focal supratentorial lesions were identified and reconstructed using maximum intensity projection, segmented, and 3D printed. The printed models were randomly evaluated by three blinded raters for selected geometric characteristics. Regression models adjusting for age, disease duration, and individual patient effects were applied to assess lesion characteristics between patient groups. Patient-level and latent class analyses between groups were performed.

Results:

1,001 supratentorial lesions were analyzed (710 MS; 291 NSWM) from 30 patients (19 with confirmed MS [11 female; median age = 33.6 years, range: 26.9-54.5], median disease duration = 2.2 years [1.4-19.4]), 11 with verified nonspecific white matter (NSWM) disease (11 female; median age = 55.0 years, range: 27.9-66.2). Lesions originating from MS when compared to NSWM patients demonstrated a higher percentage of asymmetry (75.9% vs. 43%; OR: 4.39 [2.37-8.12]; $P < .001$), complex surface morphologies (65.9% vs. 27.8%; OR: 2.3 [1.74-3.05]; $P < .001$), and were multilobular (11.0% vs. 0.3%, $P < .001$), and elongated (12.8% vs. 2.4%, $P < .001$) in shape. These characteristics were seen more frequently in the juxtacortical, deep white matter, and periventricular regions.

Conclusion:

Three-dimensional lesion data may provide further biologic insight and offer another approach for determining the etiology of these lesions.

Funding Sources:

None.

Trapeziectomy with and without ligament reconstruction for the treatment of thumb carpometacarpal arthritis

Platform Presenter: Michael Thatcher

Undergraduate Medical Student
College of Medicine, University of Saskatchewan

Team Members/Affiliations:

Zachary Oleynik (College of Medicine, University of Saskatchewan), Min Young Kim (College of Medicine, University of Saskatchewan), Laura Sims (Department of Surgery, University of Saskatchewan), David Sauder (Department of Surgery, University of Saskatchewan).

Rationale:

Trapeziectomy with ligament reconstruction and tendon interposition (LRTI) with the flexor carpi radialis (FCR) tendon is one of the most common procedures for the treatment of thumb carpometacarpal (CMC) arthritis. An alternative method involves trapeziectomy alone (TA). The trapeziectomy with LRTI procedure was developed to theoretically improve biomechanical strength and hand function when compared to TA, which leaves an anatomical void proximal to the first metacarpal. The LRTI procedure takes longer to perform and includes an autologous tendon graft. The goal of this retrospective cohort study was to evaluate the clinical outcomes of trapeziectomy with or without LRTI at a minimum follow-up of 1 year.

Methods:

A total of 43 patients who had undergone a total of 58 (TA=36, LRTI=22) surgical procedures for CMC arthritis participated in the study. The patients were evaluated subjectively (The Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire) and objectively (hand/thumb strength, pre/post-operative hand radiographs).

Results:

Both the TA and LRTI procedures provided good pain relief, motion, strength, and stability without any severe complications. Radiography showed that compared to the preoperative status, the trapezial space decreased similarly between the two groups.

Conclusion:

The TA procedure had similar outcomes to LRTI and has the advantages of shorter surgical time, less incision length, and lower surgical complexity. TA provided equivalent trapezial space to LRTI after the operation. Future study should investigate these two procedures in a head-to-head comparison rather than longitudinally where both surgeon experience and time since procedure at follow-up may have impacted results.

Funding Sources:

University of Saskatchewan College of Medicine Dean's Projects.

Radiofrequency rhizotomy under general anaesthetic: A novel approach to a classic technique

Platform Presenter: Amit Persad

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Team Members/Affiliations:

Aleksander M Vitali (Department of Surgery, University of Saskatchewan), Jonathan Norton (Department of Surgery, University of Saskatchewan).

Rationale:

Radiofrequency rhizotomy is a technique to control trigeminal neuralgia in patients who cannot be treated with microvascular decompression surgery. This technique uses thermal energy to introduce a lesion and disable a segment of the trigeminal nerve to stop the pain. The technique is classically done awake in order to consult the patient about coverage of the area of pain. The usage of this technique is difficult due to its painful nature and the patient being awake.

Methods:

We use a novel method with trigeminal nerve electromyography to monitor the division of the trigeminal nerve being lesioned. Patients are put under general anesthetic and neurophysiologic monitoring is set up. The nerve is monitored for a novel reflex, which is present only in trigeminal neuralgia and disappears once the correct lesion is applied. We performed a retrospective review of patients undergoing this procedure to determine its efficacy.

Results:

A total of 23 patients undergoing radiofrequency rhizotomy were identified. These patients had excellent pain outcomes, with control of the pain extending to mean 1 year and control of symptoms in 92% of patients after one procedure. OR staff indicated that the procedure under general anesthetic is more facile than the awake alternative.

Conclusion:

We are able to use neuromonitoring to monitor the trigeminal nerve via a novel electrophysiologic reflex. This procedure has good outcomes and is similar to those reported in the literature for the classical awake technique.

Funding Sources:

Department of Surgery Resident Research Award.

Radiological concordance with intraoperative assessment of breast implant rupture

Platform Presenter: Lyndsey Thiessen

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Team Members/Affiliations:

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Rationale:

Breast implants have received media attention regarding breast-implant associated anaplastic large cell lymphoma and breast-implant associated illness. We have observed an increase in the number of referrals for explantation. We sought to identify imaging investigation trends and concordance between reported implant rupture and intraoperative findings.

Methods:

A retrospective case series review was conducted of patient breast explantations within two plastic surgeons' practice within Saskatoon, Saskatchewan, over a 5-year period between 2014 - 2019. Data was obtained from electronic medical records and the provincial imaging databases. Descriptive analyses were performed.

Results:

Seventy-eight patients were identified with 103 separate explant events. Twenty-two patients had breast implantation for reconstruction post-mastectomy and 56 patients had aesthetic implantation. Forty-four patients had imaging assessments. Imaging modalities included ultrasound, mammogram, magnetic resonance imaging, and computed tomography. The number of investigations per patient ranged from 0-8. 95 imaging investigations were available, including 30 ultrasounds, 44 mammograms, 10 magnetic resonance images, and 11 computed tomographic images. Imaging indications included cancer screening, diagnostic imaging of the breast parenchyma, dedicated implant assessment, and assessment of unrelated medical conditions. Implant appearance was inconsistently reported. The concordance rate between imaging reported rupture and intraoperative rupture was 11/13 (85%). Cases reported as "may represent possible rupture" had a concordance rate of 6/8 (75%).

Conclusion:

Patients with breast implants undergo a large volume of imaging investigations over their lifespan. Implant assessment is inconsistently reported, though concordance between reported rupture on imaging compared to intraoperative findings is high.

Funding Sources:

None.

Traumatic spinal cord injuries among Indigenous and non-Indigenous populations of Canada

Platform Presenter: Bryan Renee

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Rationale:

Canadian Indigenous peoples disproportionately experience negative health outcomes. For traumatic spinal cord injury (TSCI), Saskatchewan data indicates Indigenous patients face a longer in-hospital stay. Outside that study, Canadian research in this area is qualitative. We expand the Saskatchewan work to provide the first Canada-wide prospective outcomes-based TSCI study comparing Indigenous and non-Indigenous peoples with an aim toward identifying areas for improvement.

Methods:

Retrospective analysis of the Rick Hansen Spinal Cord Injury Registry (RHSCIR), which prospectively collects longitudinal Canadian TSCI data from 30 centers. We restricted to patients with self-declared ethnicity to define Indigenous and non-Indigenous cohorts, comparing demographics, injury/clinical particulars, management, and outcomes.

Results:

n=3615 with 172 (5%) Indigenous vs. 3443 (95%) non-Indigenous: median age 38 vs. 47 years, 56 (33%) vs. 759 (22%) female, 67 (49%) vs. 674 (29%) injured rurally, 20 (12%) vs. 112 (3%) assault-related (all $p < .01$). Cohorts had similar total comorbidities, neurological level/severity, in-hospital mortality, and percent long-term-care discharge. 1-year follow-up for 54 vs. 1388 patients: Indigenous patients reported more physical/structural barriers to societal participation and lower post-injury employment among those employed pre-injury (12% vs. 36%, $p < .04$), this despite being generally more often of age 18–65 years (91% vs. 80%, $p < .01$).

Conclusion:

This first Canada-wide quantitative prospective TSCI outcomes study comparing Indigenous and non-Indigenous populations indicates return to community living is a major challenge for Indigenous peoples. Addressing this will require a national effort toward research and action based on principles of reconciliation, including guidance from Indigenous voices and community leaders.

Funding Sources:

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