

ABSTRACTS from 2021 Colloquium Presentations

ND Chapter - American College of Surgeon Resident Competition-Commission on Cancer- 1st Place

Retrospective review on the effects of neoadjuvant chemotherapy on borderline pancreatic cancer

Author: Eric Curto, MD

The treatment of borderline pancreatic cancer often includes neoadjuvant treatment to allow a patient to become resectable and make it to surgery. The goal of this strategy is to increase their overall survival. We retrospectively reviewed the outcomes of those patients diagnosed with pancreatic cancer at our community-cancer center in Fargo, North Dakota. We had 323 patients diagnosed with primary pancreatic adenocarcinoma, and of those patients, 71 were classified as being borderline resectable. 31 patients chose to pursue care at an outside facility, were deemed unfit for surgery, chose to forego further treatment, or died prior to receiving chemotherapy making our final total patients with borderline pancreatic cancer 37. One hundred percent of our patients received neoadjuvant chemotherapy with FOLFIRINOX (72.9%) or a gemcitabine-based treatment regimen. 24 out of the 37 patients went to surgery, while 16 patients underwent resection (43%). Ten of the 16 (63%) patients demonstrated R0 margins on final pathology. The overall survival was increased by 12.5 months in those that underwent resection versus those that did not (28.9 versus 16.4 mos., respectively, $p=.029$). These findings supported the use of neoadjuvant chemotherapy in the treatment of borderline resectable cancer leading to increased overall survival, and our data demonstrated treatment of these patients at a community-based cancer program is feasible with results similar to current literature.

Esophageal Adenocarcinoma Following Surgical Resection: A Look Back at Survival & Outcomes

Author: Robert Steininger, MD

Background: Current guidelines for esophageal adenocarcinoma involve a multimodal treatment approach and include different treatment pathways based on tumor class and staging. NCCN suggests an algorithm involving preoperative chemo radiation followed by esophagectomy for T1-T4a lesions. In those individuals declining surgery, a definitive chemo radiation regimen is recommended. For patients with T1b-T2 lesions without evidence of nodal involvement, size <2cm, and well differentiated pathology, proceeding directly to esophagectomy is an option. Typical chemotherapy regimens include paclitaxel or fluorouracil and a platinum based medication. With the advent of chemo radiation regimens that are becoming more effective, there have been discussions raised as to the role of surgical resection. This is especially questioned in those individuals who have pathological complete response following chemo radiation. Our study reviews the treatment pathways and outcomes within the Sanford Health System to evaluate the role of surgical resection following neoadjuvant chemo radiation.

Methods: Within the Sanford Health Systems, Sioux Falls and Fargo are the primary sites of surgical interventions for esophageal cancer. A retrospective chart review of all patients who underwent a trimodal treatment approach to esophageal adenocarcinoma in the Sioux Falls and Fargo Sanford Health Systems from 2009 until 2019. The chart review focuses on the overall survival rate for patients undergoing neoadjuvant chemo-radiation followed by esophagectomy. Additional information gathered includes clinical stage, post neoadjuvant staging, postoperative pathology, and postoperative complications. By comparing our community-based data to national outcomes, we hope to aid in developing the most appropriate practice guidelines and algorithms for the treatment of esophageal adenocarcinoma.

Results: 1/2009-6/2019:

- 48 patients met CROSS trial criteria and underwent surgery
- Median age at diagnosis was 65
- Survival Mean: 2.8 yrs
- 27/48 Living
- pCR – 5/48

- Most common post operative issue – dysphagia – 8%
- 5yr survival – 45%

Conclusions: Neoadjuvant chemoradiation followed by surgical resection is the ideal approach for treatment of esophageal adenocarcinoma. Surgical resection is indicated regardless of clinical complete response. The majority of patients undergoing treatment in our region receive carboplatin and paclitaxel regimens for neoadjuvant therapy. We found the rate of pCR remains small, suggesting the majority of patients still have residual disease following neoadjuvant chemo radiation. Lymph node dissection is essential as neoadjuvant therapy is successful at treating esophageal disease, but less effective at the nodal level.

ND Chapter - American College of Surgeon Resident Competition-Commission on Cancer- 2nd Place

Robotic Colon Surgery in a Community Hospital: A Case Series

Author: Tyler J Van De Voort, MD

Abstract

Background: The da Vinci robotic surgery system (Intuitive) has been purchased by a number of hospital systems. Despite its cost, the robot has been shown to be safe and comparable to laparoscopic techniques. Many small community hospitals have also been developing robotic surgery programs and have been doing so safely.

Hypothesis: Robotic colon resections can be safely performed at Altru Hospital in Grand Forks, North Dakota. Even though operating times may be longer, the results should be comparable to laparoscopic colon surgery. Additionally, the robot can be a useful tool for colon cancer operations and should be able to follow oncologic principles during resections.

Methods: This is a retrospective chart review of all robotic colon resections performed at Altru since the robot was purchased in 2018. We had a 46 colon operations in total, of which 20 cases were performed for a colon cancer. These cases were compared to 17 laparoscopic resections performed at the same institution during the same time period. Variables were age, sex, BMI, setup time, operating time, length of stay, number of lymph nodes harvested, pain meds prescribed, and any complications.

Results: There were 46 total robotic colon resections performed between August 2018 and May 2021. There were 20 cases that were performed for resection of a biopsy-proven cancer. The robotic cases were similar to laparoscopic controls in terms of setup time and patient characteristics. The robotic resections tended to have longer operating times but shorter length of stay. The robotic cases were also able to harvest enough lymph nodes for adequate oncologic resections.

Discussion: Robotic surgery at Altru Hospital is safe and sustainable and follows oncological principles for adequate resections.

ND Chapter - American College of Surgeon Resident Competition-Committee on Trauma- 2nd Place

NEGATIVE PRESSURE ON BOWEL ANASTOMOSIS DOES NOT CORRELATE WITH ANASTOMOTIC LEAKS

Author: Reid Bartholomew, MD and Kristen Reede, MD

The indications for leaving an abdomen open after surgery can include hemodynamic instability, fecal or purulent contamination, and questionably viable organs. Negative pressure wound therapy (NPWT) has become ubiquitous in managing open abdomens. While NPWT has proved its utility in open abdomen cases, it also has its own disadvantages.

We postulated that placing NPWT directly on a newly formed bowel anastomosis would lead to a higher anastomotic leak rate when compared to patients without NPWT on a newly formed bowel anastomosis.

Methods: We performed an eight-year retrospective cohort study from an existing database containing all adult patients (18 years old and greater) with open abdomens that received NPWT. Two groups were extracted from this database. The first group consisted of patients that had a bowel anastomosis with subsequent NPWT (anastomosis group). The second group consisted of patients that were left in discontinuity with NPWT placement which was then followed by a bowel anastomosis created the same day as fascial closure (control group). Anastomotic leak rate, time to closure, number of operations, time on vasopressors time in ICU, time on ventilator and mortality were analyzed for both groups.

Results: Between Jan-2013 and Dec-2020, 404 patients were obtained from our institution's database of NPWT placements. Within this group, 76 patients were placed in the anastomosis group and 77 patients were placed in the control group. The remaining patients that did not have anastomoses had NPWT used for damage control following trauma, second looks for questionable viability of organs, or an ostomy was created in lieu of an anastomosis. This study did not show a statistically significant difference in anastomotic leak rate between the anastomosis group and the control group. Anastomoses that were subject to NPWT had higher leak rates compared to those anastomoses that were not subject to NPWT, 19.7% to 13.0% respectively, but this was not statistically significant ($p=0.259$). Patients in the negative pressure applied to anastomosis group had statistically significant differences in time to closure (137 hours vs 51 hours, $p<0.001$), number of operations (3.7 vs 2.3, $p<0.001$), days on vent (8.6 vs 6, $p<0.001$), and ICU days (11.9 vs 6.9, $p=0.002$). Difference in mortality was not statistically significant.

Conclusion: This study did not reveal a statistically significant difference in anastomotic leak rate between the anastomosis with NPWT group (19.7%) and the control group (13.0%) ($p<0.259$). In light of this new evidence, we can not conclude there is a correlation between placing negative pressure on a new anastomosis and anastomotic leak. This study did demonstrate a statistically significant difference in time to closure, number of operations, days on vent, and ICU days. Given our findings, there is no statistical evidence that placing negative pressure on a new anastomosis will lead to increased anastomotic leak rate.

ND Chapter - American College of Surgeon Resident Competition-Committee on Trauma- 1st Place

Impact of Early Versus Late Palliative Care Consultation on Disposition in a Trauma Population: A Performance Improvement Analysis

Author: Lucas Holkup, MD

Background: Severely injured trauma patients undergo aggressive, cure-focused care. For these patients the ACS recommends a discussion regarding goals of care is completed within 72 hours of admission. Palliative care consultation (PCC) is often utilized, however, the difference in outcomes for earlier versus later consultation is not established.

Methods: This study is a retrospective chart review of adult trauma patients admitted to a single level II trauma center from January 2012 to March 2021. The included patients must have had an initial ISS of >14 and received PCC during the admission. Differences in outcomes for early PCC (<72 hours) versus late PCC (≥ 72 hours) were analyzed by chi-square or Kruskal-Wallis as indicated. The outcomes examined were length of stay (LOS), discharge disposition, and receipt of life-sustaining treatment (LST).

Results: Of 509 patients who met inclusion criteria, 52 (10.2%) received PCC within 72 hours. There was a similar mortality rate, however, this was not significant ($p=0.462$). Late PCC patients were more likely to be discharged to a hospice or palliative care while early-consult patients were discharged to a skilled nursing facility or to home ($p=0.002$). The proportion of patients who received LST was also not significant ($p=0.354$), however, those with late consultation

were more likely to have operative interventions (47% vs 21.2%, $p < 0.001$). Patients who received early PCC had a significantly lower overall LOS (5.0 vs 12.63 days) and ICU LOS (3.786 vs 9.330 days) compared to late ($p < 0.001$).

Conclusion: PCC within 72 hours of admission for severely injured trauma patients does not necessarily lead to less aggressive care or increased mortality. Earlier consultation does significantly decrease overall LOS and ICU LOS.

Financial Literacy of US Surgical Residents

Author: Dustin Nowotny, DO

Many surgical residents have little knowledge base in finance and practice management after graduation. They are thrust into medical practice with the expectation of self-education for the basic financial principles that they will have to apply every day. This study aimed to look at the financial characteristics, debt, and financial literacy of all the US surgical trainees during the 2020-2021 academic year. A survey was sent to all US based residency program coordinators and requested to have the survey forwarded to the residents and fellows. In total, 51 resident and fellows completed the survey. The questions assessed demographic data, consumer and educational debt, self-assessed financial knowledge and preparedness, as well as "Big 5" validated financial literacy questions. We were able to learn that only 6 respondents were not interested in learning more about personal finance. The survey was able to show that most surgical trainees have some level of financial literacy with only 3 of 51 getting 0 or 1 question of the "Big 5" correct. I believe this points to an issue of confidence in respect to financial literacy for medical trainees. This is confirmed by 51 percent of respondents stating they feel less prepared than their non-medical peers.

Effect of Laparoscopic Assisted Transversus Abdominus Plane Block in Bariatric Patients: A Retrospective Review

Author: Joclyn Seiler, MD

Background: Transversus abdominus plane (TAP) blocks have been described in anesthesia literature since 2001. Traditionally they are ultrasound guided and performed by the anesthesia team. This can be technically challenging in the bariatric patient population as tissue planes are not as clear. Laparoscopic assisted TAP (L-TAP) blocks have been shown to be non-inferior to ultrasound guided blocks. This study aims to see if L-TAPs decrease the amount of narcotics required in comparison to standard port site infiltration.

Study Details: Retrospective chart review looking at patients undergoing laparoscopic Roux-en-Y gastric bypass, between February 2019 and February 2020, at a single center in North Dakota. Those excluded from the study: those with prior history of foregut surgery or lysis of adhesions for greater than 2 hours. Data collected: Gender, Age, BMI, ASA, medical comorbidities, and amount of narcotics used. All narcotics were converted into IV Morphine Equivalents. The morphine equivalents were then broken down into different time periods.

Results: There were 175 patients identified, with only 150 of those patients (25 male 125 female) included in this study due to exclusion criteria. The patient characteristics were not statistically significant between the two groups. The only significant difference detected between the two groups were the usage of IV opioid pain medications during POD#0 (TAP Block group: 4%; Control group: 16%, $p = 0.01$); and the usage of PO opioid pain medications during POD#1 (TAP Block group: 60%; Control group: 41%, $p = 0.02$).

Discussion: Although not what was expected, the results of this review follow some of the trends found in the literature. The study also brings to light the differences in post-operative orders between different providers,

Comparison of Intercostal Cryoablation versus Thoracic Epidural following Minimally Invasive Pectus Excavatum Repair

Author: Chani Taggart

Background: Minimally invasive pectus excavatum repair (Nuss procedure) is associated with significant postoperative pain leading to prolonged hospital stay and significant narcotic pain medication requirements. It is hypothesized that intercostal cryoablation during Nuss procedure reduces inpatient narcotic pain use and hospital length of stay.

Methods: This is a retrospective review of medical records of patients who underwent Nuss procedure, comparing those who had intercostal cryoablation to those who had thoracic epidural from December 2014 to January 2021. The primary outcomes were postoperative length of stay (LOS) and inpatient narcotic pain requirements. Other variables compared included correlation of age and Haller index. Primary outcome data was analyzed using independent sample t-tests while Pearson correlation tests examined the relationships of secondary variables.

Results: A total of 37 patient charts were reviewed with 7 undergoing thoracic epidural and 28 undergoing intercostal cryoablation. The average LOS for cryoablation group was 2.46 days (range 1-5) which was significantly lower than the average LOS of thoracic epidural group of 4.429 days (range 4-5) ($p < 0.001$). Cryoablation group also required significantly less narcotic pain medications when compared to thoracic epidural with average MME of 108.510 versus 244.182 ($p < 0.001$). Regarding age and Haller index severity, no correlation was appreciated on the LOS or average narcotic pain requirements.

Conclusions: Intercostal cryoablation during minimally invasive pectus excavatum repair decreases hospital LOS and narcotic pain medication need compared to thoracic epidural. These findings support the use of intercostal cryoablation to improve postoperative pain control and improve patient outcomes.

Overall Research Colloquium 2021 Winner

The Effect of Clinical Rotations on Performance

Author: David Velez, MD

Introduction: The American Board of Surgery In-Training Examination (ABSITE) is given annually to general surgery residents. There is evidence that exposure to certain clinical rotations may correlate with ABSITE performance, particularly in interns who have only had seven rotations prior to taking their first exam. The exact effect, however, is not entirely understood.

Methods: We performed a retrospective review of all University of North Dakota general surgery interns from 2016-2020. We compared first-time intern ABSITE performances to their clinical rotations throughout the first seven months of the academic year, July-January. "Hard" rotations at our institution are defined as Trauma and Acute Care Surgery (TRACS), Surgical Critical Care (ICU) and Cardiothoracic-Vascular Surgery (CT-Vascular). These rotations have significantly less free time outside of clinical duties to allow studying.

Results: There were 26 intern performances included in the review with an average percentile score of 62.6%. No positive correlation was seen between performance and ABSITE category weight of the rotations. There, however, was a significantly negative correlation of performance for interns having more the four of the first seven months in "hard" rotations or if they had "hard" rotations in both December and January before the exam.

Conclusion: The education gained through clinical rotation appears to have a smaller effect on ABSITE performance than does time for individual study. Although clinical rotations could be optimized for ABSITE performance, a program should primarily determine schedules with the goal of producing excellent trained surgeons, not simply excellent test-takers.

Carotid Endarterectomies in a Community Hospital

Author: Matthew Zweerink, MD

Carotid endarterectomy is a prevalent procedure in the United States. Annually there are over 800,000 strokes in the US every year and 20% of these are related to carotid artery disease. It is well established that if local services are available patients will be more likely to pursue both treatment and follow up for disease states. In our study we followed 4 years of carotid endarterectomies in a community facility and compared them to national benchmarks. There were 191 cases identified and patients were followed through the 30 day perioperative period. This study boasts 100% compliance to follow up. Statistically significant differences, favoring the community facility, were identified in MI (0.5%) and cranial nerve injury (2%) when compared to benchmark data. All other complications followed did not demonstrate statistically significant differences. Data appears to support performing CEA in a community facility if the proper team is available.

One Merchant Ship, One Oil Tanker and One Successful Appendectomy

Author: Max Hansen, DO

A historical review and case report of the first appendectomy ever performed on a submarine 120 feet below sea level and far behind enemy lines during World War II. Told uniquely from the perspective of a modern-day rural surgeon with an emphasis on the extraordinary leadership, teamwork, and heroism of the endeavor. All health care providers and administrators are in desperate need of these qualities to successfully unite, navigate, and conquer the attacks on today's healthcare system.

“Delay in treatment in rural America: Right colectomy with a twist.”

Author: Matthew Cziep

Often surgical care can be delayed in the rural America either due to a lack of a surgeon, transport times to an appropriate facility, delay in diagnosis, weather phenomenon, and a myriad of other reasons. This case report is of a 74 year female who presented to a rural hospital with complaints of abdominal pain. She was diagnosed with a small bowel obstruction. Transfer to a tertiary facility was initiated after 48 hours without improvement in her condition. Her treatment was delayed due to a combination of an inaccurate abdominal XR read, and lack of a surgeon to evaluate the patient. After arrival at the tertiary facility a CT scan confirmed high grade bowel obstruction. An exploratory laparotomy revealed internal herniation of the right colon through the foramen of Winslow. This necessitated a right colectomy. Her post-operative course was uncomplicated. Foramen of Winslow hernia account for about 8% of all internal hernias but 0.08% of all types of hernias. As this is an uncommon occurrence there is no guidelines for resection vs pexy of the herniated segment of bowel. Resection is the highest reported procedure but there have been no reports detailing the outcomes of resection vs pexy. This case shows the necessity of increased access to surgical care in the rural setting.

The use of tissue plasminogen activator (tPA) in the management of frostbite injury: a single site retrospective review

Author: Lukas Mueller, MD

Abstract

Purpose: The aim of this retrospective study is to determine patient outcomes after hypothermal injury. This study will look at the timing of tPA administration, patient demographics, and outcomes including amputation, morbidity, and hospital course. The results will be used to develop a better-defined protocol for the administration of tPA.

Methods: Non-identifiable patient data was obtained over a 5-year timeframe from the electronic medical record including the following variables MRN, Initials, DOB, date of injury, diagnosis, level of frostbite injury, treatment modality, amputation yes/no, affected digit(s) and extremity(ies), tPA yes/no, time to tPA administration, gender, discharge disposition, alcohol levels, drug test results, mental health diagnoses, co-morbidities, length of hospital stay, imaging findings, secondary complications. The primary endpoints to be evaluated are amputation presence and the level of amputation. Secondary complications include socioeconomic impact, infections, and morbidity. The data points were analyzed with chi-square tests, ANOVA, Fisher's exact tests will be performed to determine which categories were significantly different from one another, and ANOVA test will be used to compare continuous variable. All p-values will be two-sided, and p-value <0.05 will be considered significant

Results: Of our 58 patients that qualified for the study review, 47 (81%) were male, 40 were white (69%), and 10 were American Indian (17.2%). Of the 58 patients, 8 of them received tPA administration within the 24-hour timeframe. 20/38 (52%) tested positive for alcohol, 9/25 (36%) tested positive for substance use, and 5/58 (8.6%) were on anticoagulant therapy. Among these patient factors, and many other variables, there was no statistically significant variable directly associated with outcome. The only statistically significant variable that determined amputation rate was the frostbite stage (stage 3 or 4 had a statistical higher chance of receiving tPA). The amputation rate for non-tPA administrated patients was 3/50 (6.0%) versus 1/8 (12.5%) for patients having been administered tPA. The use of tPA did not demonstrate statistical significance for avoiding amputation.

Conclusion: Our institutional data demonstrates that there has been improvement in instituting earlier imaging to assess limb perfusion as opposed to relying on physical exam alone. This study is limited in the power of the study with only 4 of 58 patients identified as necessitating an amputation (some due to transfer with unknown follow-up and therefore removal from this retrospective review). Eight of 58 patients received tPA, with reasoning for non-tPA use including unknown time from injury, unknown frostbite time course, and unknown history in the setting of moderate frostbite tissue. In reviewing similar articles on the topic matter, our institution can still move forward with evaluation of modifying the protocol to earlier imaging, defining the frostbite tissue involved, determining the appropriate timeline of events, and protocolizing a timeframe for tPA administration. Further data collection with more defined variables and frostbite specific documentation may allow improved statistical analysis and power of the study.