6:35am - 6:40am
P1. IMPACT OF NOVEL WOUND PROTECTION DEVICE ON OBSERVED VS EXPECTED SURGICAL SITE INFECTION RATES FOLLOWING COLECTOMY USING THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM RISK CALCULATOR

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Presenter: Harry T. Papaconstantinou MD

Background: Surgical site infection (SSI) remains a persistent and morbid problem in colorectal surgery. A novel surgical device that combines barrier wound protection and retraction with continuous wound irrigation was evaluated in a cohort of elective colorectal surgery patients as a proof in concept study. We previously reported this device significantly reduced wound contamination in elective colectomy operations. However, the impact on expected SSI rates is not known. The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) risk calculator is a validated model used to prospectively predict surgical complications according to operative procedure, patient demographics and specific medical comorbidities. The purpose of this study was to compare the observed vs expected (ACS-NSQIP risk calculator) rates of SSI in our prospective study using a novel barrier wound protector with continuous irrigation in a cohort of patients undergoing colorectal operations.

Methods: A prospective multi-center study of colectomy patients was conducted using a study device for wound protection and retraction, as well as irrigation of the incision. Irrigant was normal saline mixed with a broad spectrum antibiotic. Patients were followed for 30 days after surgery to assess for SSI. Following completion of the study, the patient’s characteristics were retrospectively entered into the ACS-NSQIP risk calculator to determine the expected rate of SSI for the given patient population and compared to the observed rate in the study.

Results: A total of 108 subjects were enrolled in the study with a mean age 60 years and mean BMI 28.8 kg/m2. Procedure approach included laparoscopic and robotic (53%), hand assisted laparoscopic (15%), and open or conversion to open (32%). The most common anatomic location of colectomy was left sided/sigmoid (37%), right/ileocolic (33%) and anterior resection of the rectum (13%). The observed rate of SSI was 3.7% (4/108). The expected rate of SSI in the same patient population utilizing the ACS-NSQIP risk calculator was determined to be 9.5%. The observed/expected ratio was 0.39, which demonstrates a 61% decrease (3.7% vs. 9.5%, p=0.02).

Conclusion: These data indicate that the reduction of wound contamination in elective colorectal surgery patients using a novel wound protection, retraction, and continuous irrigation device may significantly reduce the rate of SSI in colorectal surgery. Future prospective randomized controlled trials are needed to verify this proof in concept study.
Background: Patients with extremity and trunk liposarcomas (LPS) are treated primarily with surgical resection, with radiation used for a number of anecdotal reasons, including large size, unfavorable site and positive margins. Studies performed thus far have evaluated the effect of radiation on outcomes in extremity and trunk soft tissue sarcomas of all histologic subtypes; however, the appropriate role for radiation in patients with extremity and trunk LPS, specifically, have not been evaluated.

Methods: A retrospective chart review of patients with extremity and trunk soft tissue LPS referred to a stand-alone cancer center from January 1995 to December 2011 was performed. Demographics, location, treatment, pathology and outcomes were abstracted.

Results: One hundred and ninety two patients with extremity and trunk soft tissue LPS were identified: 61% were female, mean age was 58 years (range 30-85 years), 80% were seen for a primary tumor. 98% had initial surgical resection, 18% received neoadjuvant or adjuvant radiation. Of the resected patients, 94% had well differentiated liposarcomas (WDL) (N=181); of which 2% had a focal area of dedifferentiation. Dedifferentiated liposarcomas (DDLPS) comprised the remaining 6% (N=11). Margin status was identified in 81%; of those identified, 77% had positive margins. 29% of resected patients developed recurrent disease; median time to recurrence was 10.8 years (range 0.2-22 years; 18 years for patients with WDL and 3.6 years for patients with DDLPS). 55% of patients with DDLPS and 27% of patients with WDL developed recurrent disease. Of the 56 patients who recurred, 30% received radiation. 76% of patients who received radiation for a recurrence went on to develop a second recurrence, compared with 96% of those that did not (p=0.02). On multivariate (MV) analysis, female gender (p=0.02, OR 2.07, CI 1.09-3.92), DDLPS (p=0.005, OR 3.49, CI 1.45-8.40), tumor size < 10 cm (p=0.01, OR 2.03, CI 1.17-3.53) and difficult area of resection (p=0.005, OR 4.56, CI 1.59-13.11) were predictive of increased risk of recurrence. Older age (p=0.02, OR 2.95, CI 1.17-7.41), DDLPS (p<0.001, OR 27.83, CI 5.17-94.88) and difficult area of resection (p=0.02, OR 10.57, CI 1.44-77.47) were associated with the administration of radiotherapy. In WDL tumors, size < 10 cm (p=0.005, OR 2.30, CI 1.29-4.12) and difficult area of resection (p=0.02, OR 3.41, CI 1.21-9.64) were predictive of increased recurrence on MV analysis.

Conclusion: Patients with extremity and trunk LPS were found to have a significant risk of local recurrence (29%); DDLPS pathology and difficult area of resection were associated with increased local recurrence. Administration of radiation therapy was not associated with decreased recurrence overall, however there was a lower incidence of second recurrences in patients who received radiation therapy at their first recurrence. Radiation therapy should be considered in patients with recurrent disease.
P4. PREDICTING ORGAN DYSFUNCTION AFTER TRAUMATIC BRAIN INJURY (TBI): THE HEMOGRAM SCORE

University of Arizona
Presenter: Muhammad Khan MD

**Background:** Organ dysfunction following Traumatic Brain Injury (TBI) is common and is associated with worse outcomes. Hematological parameters; neutrophil to lymphocyte ratio (NLR), Red Cell Distribution Width (RDW), and Mean Platelet Volume (MPV) are indicators of post traumatic inflammatory response. The aim of our study is to determine the prognostic value of these parameters in predicting organ dysfunction after TBI.

**Methods:** We performed a 4 year (2012-2014) retrospective review of all isolated severe TBI patients (head AIS≥3 and other AIS <3) and age equal to or more than 18 years admitted to ICU at our level I trauma center. NLR, RDW, and MPV for each patient based on admission laboratory parameter was obtained. Outcome measures was organ dysfunction [renal (creatinine >1.20), cardiac (MAP<70 or requiring pressers), respiratory (PaO2/FIO2<300) and hepatic (bilirubin>1.2)]. The predefined cut off was selected as 15.5% for RDW, 8.75fl for MPV, and 8.19 for NLR. Multivariate regression analysis (to control for demographics, admission vitals, injury parameters), conversion of odds ratio to point based system, and receiver operating characteristic (ROC) curve analysis was performed to calculate predictive power of the index.

**Results:** A total of 262 patients were included. The mean age was 49 ± 23 years, 75.8% were males, median [IQR] Glasgow coma scale (GCS) was 8 [5-12], and median Injury Severity Score (ISS) was 19[16-26]. The overall organ dysfunction was 43.9% and in-hospital mortality rate was 19.1%. On regression analysis, NLR (OR: 3.1), RDW (OR: 4.9), and MPV (OR: 2.2) were independent predictors of organ dysfunction. Odds ratios were converted to point based system to create a score with weighting of NLR: 2, RDW: 3, and MPV: 1. The AUROC of this score for predicting organ dysfunction was 0.801. A score of 3 or above had a specificity of 81% and sensitivity of 71%. Patients with score >3 had higher organ dysfunction rate (76.2% vs 23.9%, p<0.001), and was independent predictor of organ dysfunction (OR: 4.2 [2.5-6.9], p<0.001).

**Conclusion:** Hemogram score can serve as a reliable potential marker for early detection of organ dysfunction after traumatic brain injury. Using parameters obtained as part of the hemogram, NLR–RDW–MPV, we were able to create a specific, high-quality, low-cost outcome prediction marker for organ dysfunction in TBI patients that is easy to use. Prospective validation of this score is required to establish its utility in clinical practice.
Background: Patient-derived xenografts (PDX) generated from surgically resected tumor tissue provide highly accurate cancer models that recapitulate patient cancer phenotype and allow for highly correlative studies on biomarkers and chemotherapeutic efficacy. Engraftment failure at primary engraftment has significant consequences on program take-rate efficiency, wasted resources and costs. Primary engraftment failure varies by patient and tumor type and is also confounded by lymphomagenesis. Secondary engraftment rates of previously cryopreserved primary patient malignant tissues are unknown. In this study we performed secondary PDX engraftment from cryopreserved patient tumor samples that previously failed primary engraftment with the hypothesis that successful secondary engraftment is feasible and may allow for development of previously unavailable PDX models as well as decreased rates of lymphomagenesis.

Methods: Our program has generated over 280 unique patient cancer PDX models with very high but variable rates of efficiency (10-90%) dependent on patient and tumor type. With institutional approval and informed consent, cryopreserved original cancerous patient tissues failing previous primary engraftment were subcutaneously implanted in immunocompromised mice pretreated with rituximab for secondary engraftment attempts. Mice were monitored for successful engraftment and growth metrics were calculated: time to tumor formation (TTF), time to harvest (TTH), overall take rate (OTR), and secondary engraftment efficiency. Established xenografts were verified by a hepatobiliary pathologist for tumor histomorphology and immunochemistry compared to original patient tissue through multiple generations.

Results: A total of 55 tumors were secondarily reanimated from cryopreserved original patient tissue including those that initially failed primary engraftment (n=46, 84%) and those that developed lymphomagenesis (n=9, 16%). After secondary engraftment we successfully developed 29 new histologically validated PDX models with an overall secondary engraftment efficiency of 52%. Tumor types reanimated included cholangiocarcinoma (n=12), pancreatic ductal adenocarcinoma (n=16), and adenosquamous carcinoma (n=1). Lymphomagenesis occurred in only 5 xenografts (9%) with an overall decrease of 44% compared to primary engraftment. Tumor types that did not grow after both primary and secondary engraftments comprised of hepatocellular carcinoma (n=10), pancreatic ductal carcinoma (n=9), and cholangiocarcinoma (n=2).

Conclusion: Successful secondary engraftment of previously failed PDX models from cryopreserved cancerous tissue is feasible and can result in a 50% increase in efficiency with similar decrease in lymphomagenesis. This technique allows salvage of critical patient cancer models that would otherwise not exist. Overall successful engraftment appears to be tumor type-dependent with worst outcomes in hepatocellular carcinoma. These results may have substantial impact on any program utilizing PDX.