

1. A 25 YEAR EXPERIENCE WITH SHORT BOWEL SYNDROME SECONDARY TO RADIATION THERAPY

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Background: The short bowel syndrome (SBS) can be caused by abdominal and pelvic malignancies treated by radiation therapy (XRT). The management and long term outcome of these patients is poorly defined.

Patients and Methods: 48 adults developing SBS after XRT over a 25 year period were reviewed. There were 36 females and 12 males ranging from 19 to 78 years old. Follow up ranges from 1 to 360 months.

Results: The underlying cancer in females included rectum (n=13), ovary (n=8), uterus (n=7) and cervix (n=6). In males rectal cancer (n=4) was most common. The interval to SBS was 1 to 234 months and 16 (33%) developing SBS within 12 months. The indication for operation was intestinal obstruction (n=35), fistula (n=9), perforation (n=5) and ischemia (n=2). 34 (71%) patients underwent multiple resections and residual radiation enteritis was present in 34 (71%). Intestinal remnant length was \leq 60cm in 11 patients, 60-120cm in 16 patients and 120-180cm in 21 patients. 36 (75%) patients had undergone colectomy and 28 (58%) had an ostomy. 30 (62%) patients remain on PN. 9 (20%) patients were weaned to enteral nutrition. 23 (48%) patients had further intestinal procedures, including 2 intestinal transplants. 17 (35%) patients have died, 8 within 12 months.

Conclusion: SBS develops within months to years after XRT for mainly gynecologic and rectal malignancies. Intestinal obstruction is most common reason for operation. Multiple resections, colectomy, and ostomy are frequently performed. Long term survival is possible in many patients although further surgical intervention, including transplantation, is often required.

2. THE USE OF A NEW COMPRESSION DEVICE AS AN ALTERNATIVE TO HAND-SEWN AND STAPLED COLORECTAL ANASTOMOSES: IS THREE A CROWD?

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Background: Currently, the two available methods for the creation of colorectal anastomoses are hand suturing and stapling devices. These do not provide an immediately “sealed” anastomosis and are prone to uncommon but serious complications such as anastomotic bleeding, strictures, or leaks. Compression anastomosis with the recently developed NiTi CARTM 27 device is a newer surgical technique consisting of two disposable rings that trap the ends of transected bowel, bringing them into opposition. The nitinol alloy Compression Anastomosis Rings (CARTM) exhibit super elasticity and shape memory to provide uniform compression to the tissue resulting in a secured, immediately sealed anastomosis. In animal models, this produces anastomoses with higher bursting strength and less stricture formation. An analysis of this device in the creation of colorectal anastomoses in humans has yet to be reported.

Objective: To evaluate the safety, technical feasibility, and effectiveness of the CARTM 27 device in the creation of left-sided colorectal or colo-colonic end-to-end compression anastomoses.

Methods: A non-randomized, prospective pilot study evaluating the outcomes of the NiTi CARTM 27 compression anastomosis device in patients undergoing a left-sided colectomy between March 2008 and August 2009 was performed. Endpoints associated with safety, technical feasibility, and effectiveness were analyzed.

Results: Twenty-three patients (9 males; 14 females) underwent a left-sided colectomy and subsequent compression anastomosis (12 laparoscopic; 11 open) with the CARTM 27 device for malignancy, colonic fistula, rectal prolapse, or chronic diverticulitis. The mean post-operative hospital stay was 7.3 (range 3-41) days. Mean post-operative follow up was 94.7 (range 14-214) days and mean time to return of bowel function as indicated by the passage of flatus was 5 (range 2-31) days. Surgical complications were grouped into two categories: minor morbidities, 4/23 (17%) patients, which included two small post-operative abscesses requiring antibiotics alone and two post-operative anastomotic strictures requiring balloon dilation; and major morbidities, 1/23 (4%) patients, which included a partial anastomotic dehiscence/leak requiring a return to the operating room for dismantling of the anastomosis and diversion.

Conclusion: Tissue compression using the CARTM 27 device shows promise as a safe and effective alternative for the creation of colorectal anastomoses. However, based on our experience, further, preferably randomized, studies in a larger patient population are warranted to fully elucidate any long-term clinical advantages of this device.

3. LAPAROSCOPIC CHOLECYSTECTOMY PERFORMED AFTER CHOLECYSTOSTOMY TUBE PLACEMENT

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Background: Cholecystostomy tube placement is a useful tool in the management of acute cholecystitis in critically ill patients that are not regarded as operative candidates. Laparoscopic cholecystectomy can be safely performed after cholecystostomy tube placement with an acceptable rate of conversion to an open procedure.

Methods: A retrospective analysis of all cholecystostomy tube placements was performed at a single institution. Charts were reviewed for duration of cholecystostomy tubes, type of surgical intervention, timing of surgical intervention, and patient outcomes.

Results: From November 2001 to July 2006, 220 patients underwent cholecystostomy tube placement. There were 116 male and 104 female patients whose average age was 64 (range 19 – 97). Of the 220 patients, 96 (44%) underwent a cholecystectomy. The average duration of tube placement prior to cholecystectomy was 51 days (range 5-244). Six of 96 patients underwent an open cholecystectomy without any laparoscopic attempt. A laparoscopic cholecystectomy was attempted in 90 patients with 17 (18.8%) converted to an open procedure. Age, gender, and duration of tube placement were not predictive of conversion. Of the 124 patients who never underwent cholecystectomy, 60 (48%) expired with their tube in place. An additional 43 (35%) patients had the tube removed and did not require a cholecystectomy or another cholecystostomy tube at our institution during the follow-up period. The remainder are being followed (n=2) or were lost to follow-up (n=19).

Conclusions: Cholecystostomy tube placement is a useful, safe instrument in the management of cholecystitis in the critically ill patient. For those patients who can undergo definitive surgical therapy at a later time, there is a high probability of a successful laparoscopic cholecystectomy. A previous laparotomy is the greatest predictor of a failed laparoscopic approach. Many patients expire with their cholecystostomy tube in place.

4. IMMUNE STATUS IS PREDICTIVE OF OUTCOME IN HIV POSITIVE PATIENTS UNDERGOING ABDOMINAL OPERATIONS

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Background: Patients with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) comprise increasing subsets of the surgical population. We evaluated impact of HIV/AIDS in an urban population on outcome after abdominal operations.

Methods: Records of patients with preoperative diagnosis of HIV/AIDS undergoing abdominal operations from 1997-2007 were reviewed. Clinical variables were examined for impact on outcome.

Results: There were 79 patients (70% male, mean age 41) with HIV/AIDS undergoing abdominal operations (mean CD4 count 210 mg/dl; mean viral load [VL] 205x10³ copies/mL). There were 34 patients (43%) who had received highly active anti-retroviral therapy (HAART); 19 (24%) had previous opportunistic infection. Patients undergoing urgent procedures (53%) had lower CD4 counts than those having elective procedures (129 vs 303, p=0.002) with no difference in VL (268x10³ vs 158x10³, p=0.228). The 20 patients undergoing multiple procedures (range 2-20) had lower CD4 counts than those having one (131 vs 234, p=0.028) with no difference in VL (279x10³ vs 193x10³, p=0.493). Patients with complications (41/79, 52%) had lower CD4 counts than those who did not (149 vs 291, p=0.015) with no difference in VL (224x10³ vs 189x10³, p=0.699). On multivariate analysis, only CD4 count was independently associated with postoperative complications: age, gender, VL, HAART, opportunistic infection and urgent operation were not. Neither CD4 count nor VL predicted mortality (23/79, 29%).

Conclusion: Preoperative CD4 count predicted outcome in patients undergoing abdominal operations. Lower CD4 counts were associated with urgent procedures, multiple procedures, and postoperative complications. Preoperative optimization of immune status for elective operations is recommended.

5. TRANSGASTRIC ENDOSCOPIC DRAINAGE OF PANCREATIC FLUID COLLECTIONS EQUIVALENT TO SURGICAL DRAINAGE WITHOUT THE USE OF STENTS OR IRRIGATION CATHETER

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Background: Pancreatic fluid collections like pseudocyst or organized necrosis often require drainage. These patients usually have multiple organ failure. Therefore, open surgical and/or multiple procedures could be detrimental. The technique of drainage has evolved from open surgical to laparoscopic to transluminal endoscopic surgery. A simplified approach to treat pancreatic fluid collections using transgastric endoscopic drainage (TED) is described. Our technique provides drainage equivalent to open surgical or laparoscopic approach, without use of stents, or irrigation catheter.

Methods: A retrospective study of eight patients treated over 30 months with TED was performed. There were 6 males and 2 females. Mean age was 47 years (range 30 - 74). One patient had pancreatic pseudocyst and all others had organized pancreatic necrosis following necrotizing pancreatitis. All were symptomatic. Of 8 patients, 4 were in intensive care unit with multiple organ failure. CT scans in all revealed a large fluid collection causing significant compression of the gastric wall. Based on this, TED was planned. Under general anesthesia, a dual channel endoscope was used. Based on the location, a bulge along the posterior or medial gastric wall was noted. Endoscopic ultrasound was used in 4 patients. Transgastric entry in to the pancreatic fluid collection was obtained with an endoscopic argon coagulator probe or a needle knife. In all patients, dark fluid leaked out confirming correct entry. Next, a needle knife and sphincterotome with electrocautery were used to extend the cystogastrostomy. About 4 cm wide opening was established. The endoscope was easily introduced in to the cavity and a large amount of necrotic material was visualized in all. Copious irrigation was performed. No significant bleeding was noted.

Results: Within 24 hours all patients showed improvement. Repeat endoscopy, extension of cystogastrostomy, necrosectomy and washout through the endoscopic approach was performed in all with pancreatic necrosis till cavity was granulating.

Conclusion: Open surgical drainage is associated with significant morbidity and mortality. Laparoscopic drainage, through either transabdominal or retroperitoneal approach has been described to reduce morbidity associated with open surgery. Recently, transluminal endoscopic drainage either through the stomach or duodenum has been described. Previous authors utilized balloon dilation to widen the cystogastrostomy and often have used up to two stents to maintain drainage. Also, different types of tubes have been placed in the necrotic cavity for post-procedural irrigation. The technique described here is an extension of those previously described. Using simplified technique of TED, drainage almost equivalent to that of open surgical or laparoscopic technique was accomplished. By establishing wider drainage, stents, irrigation catheters and repeat procedures could be avoided improving cost and facilitating early recovery.

6. THE NUMBER OF NEEDLE PASSES AFFECTS THE ACCURACY OF PARATHYROID HORMONE ASSAY WITH INTRAOPERATIVE PARATHYROID ASPIRATION

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Background: Aspiration of cervical or thyroid nodules with parathyroid hormone (PTH) assay before or during parathyroid operations helps confirm whether the nodule is a parathyroid tumor. The reported number of needle passes required for improved accuracy varies in the literature. We sought to prospectively determine if the number of passes affected the accuracy of PTH monitoring.

Methods: A prospective analysis was performed on 25 consecutive patients who underwent a parathyroidectomy for primary hyperparathyroidism. The excised parathyroid gland was aspirated using a 25-gauge needle in a 5 cc syringe filled with 1 ml of saline. The numbers of passes (1, 3, and 5) were compared to the PTH levels. The data were analyzed utilizing the ANOVA and Student's t-tests to calculate the two-tailed p-value.

Results: Of the 25 glands aspirated, a difference in the mean PTH value was noted with the number of passes; 2022 pg/ml for 1 pass, 2276 for 3 passes, and 2677 for 5 passes ($p = 0.0172$). False negative (<1000 pg/ml) results were seen in 4 of 25 samples with 1 pass, 3 of 25 with 3 passes, but 0 with 5 passes. Accuracy was dependent on the number of passes, with 5 passes having less PTH variation than 1 or 3 passes ($p < 0.04$).

Conclusions: Aspiration of nodules to determine the PTH level helps confirm the presence of parathyroid tissue. The number of needle passes affects the accuracy of the PTH level. Although 1 and 3 passes are usually successful, 5 passes is optimal to attain no false negative results.

7. SUCCESS IN SENTINEL LYMPH NODE PROCEDURES IN OBESE PATIENTS WITH BREAST CANCER

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Background: The accuracy and consistency of sentinel lymph node (SLN) biopsy for axillary staging in breast cancer has been well established by multiple studies. Various reports have identified factors such as increased age and obesity as important variables that may affect the success in identification of sentinel nodes and the overall false negative rate (FN). Recent evidence linking obesity as a risk factor for breast cancer recurrence makes the case for maximizing the accuracy of the pathologic status of lymph nodes in this population of women. A retrospective review was done to compare variables and outcomes of SLN procedures in obese and non-obese women in order to ascertain if obesity was a significant barrier to obtaining an accurate pathologic diagnosis.

Methods: All SLN procedures performed by a single surgeon, in women with clinical T1-T2 N0 disease, between September 2000 and March 2009 were retrospectively reviewed under an IRB approved protocol. Demographic, disease and surgical procedural variables were collected. Cases were grouped into those with a BMI of ≥ 35 (n=26) for comparison to those with a BMI ≤ 25 (n=81). A BMI ≥ 35 was defined as obese. Univariate non-parametric and Chi-square statistical analyses were employed. Values are reported as mean \pm standard deviation.

Results: A total number of 235 SLN procedures were reviewed. The age was 58.6 \pm 11.8 (range 28-88), tumor size was 1.8 \pm 1.3 (range 0.2-7.4), and BMI was 28.6 \pm 6.1. The number of SLN found was 3.6 \pm 1.9 (range 0-10). The overall false negative (FN) case rate was 11%, 20 of 184 cases in which intraoperative testing was performed. There were 2 cases in which no SLNs were able to be identified, for a overall failure rate of 0.85%. With respect to BMI grouping there were no differences in age, tumor size, mastectomy rate, time from initial biopsy to SLN procedure, SLN detection method, time from radioisotope injection to SLN procedure, ER/PR values, tumor differentiation, FN case rate, or number of positive SLN or total positive axillary nodes. In contrast, patients with a BMI ≥ 35 had significantly lower external hot spot counts (363 \pm 394 vs 743 \pm 607, $p=0.002$) and first SLN counts (1182 \pm 1581 vs 2909 \pm 4893, $p=0.01$), with a trend in lower counts in subsequent nodes, compared to patients with a BMI ≤ 25 . There were significantly fewer SLNs recovered in the BMI ≥ 35 group, 2.9 \pm 1.7 vs 3.9 \pm 2, $p=0.02$.

Conclusions: In this review, women with a BMI of ≥ 35 , had lower external hot spot counts, lower individual sentinel node counts, and fewer SLNs recovered however, pathologic staging of the axillary basin was still achieved. Therefore, we conclude that SLN biopsy procedures in obese women has sufficient accuracy and consistency for axillary staging.

8. A SIGNIFICANT NUMBER OF WOMEN PRESENT WITH AGGRESSIVE PALPABLE BREAST CANCER EVEN WITH A NORMAL MAMMOGRAM WITHIN ONE YEAR

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Background: Mammography and clinical breast exam (CBE) are the gold standard for breast cancer screening, but CBE and self breast exam (SBE) have shown limited additional benefit to mammographic screening. We sought, therefore, to evaluate the incidence and clinical and pathologic characteristics of women presenting with palpable breast cancer who had a normal mammogram within one year.

Methods: Retrospective review of a prospectively collected database of patients treated at a single institution for invasive breast cancer from 2000- 2008. We compared three groups: women with breast cancer detected by imaging only (non-palpable), women who presented with palpable breast cancer by SBE or CBE and had not undergone a mammogram within 1 year (mammo > 1 yr.), and those with palpable breast cancer who had normal mammography within 1 year (mammo < 1 yr.). Women with palpable breast cancer who had never received a mammogram were excluded from the data. Continuous variables were compared among the three groups using ANOVA F-tests and categorical variables were compared using chi-square tests.

Results: Of 1222 women 813 (67%) were in the non-palpable group, 254 (21%) were in the mammo > 1 year group, and 155 (13%) in the mammo < 1 year group. The mean tumor sizes were 1.3 cm (non-palpable), 2.2 cm (mammo > 1 yr.), and 2.3 cm (mammo < 1 yr.) ($p<0.0001$). The rates of lymph node metastases were 18% (non-palpable), 35% (mammo > 1 yr.), and 48% (mammo < 1 yr., $p<0.0001$). Triple negative disease (ER-/PR-/HER2 normal) was more common among patients with palpable disease: 7% of non-palpable disease, 12% of mammo > 1 yr., and 13% of mammo < 1 yr. ($p=0.008$). ER+ disease was more common among those patients with non-palpable tumors ($p=0.025$). No significant differences between groups were seen with regards to multifocal disease, family history or BRCA mutations. Fewer women in the palpable disease groups underwent breast conserving surgery: 77% of non-palpable vs. 65% of mammo > 1 yr. vs. 59% of mammo < 1 yr. patients ($p<0.0001$). Cytotoxic chemotherapy was given twice as often to those with palpable disease: 21% of non-palpable, 45% of mammo > 1 yr., and 48% of mammo < 1 yr. ($p<0.0001$).

Conclusions: Thirteen percent of patients present with palpable masses on SBE or CBE despite a normal mammogram within one year. These patients tended to have more aggressive tumors (larger size, lymph node metastases, and triple-negative disease) resulting in more aggressive therapy (higher mastectomy rate and greater likelihood of chemotherapy). Patient detection and clinician palpation of breast lesions, therefore, remain important components of breast cancer diagnosis even among mammographically screened populations.

9. ANTIBIOTIC PROPHYLAXIS IN THE PLACEMENT OF TOTALLY IMPLANTED CENTRAL VENOUS CATHETERS

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Background: Antibiotic prophylaxis is considered the standard of care for most surgically placed implantable devices. However, the current literature, including a Cochrane review of four randomized trials, has shown no decrease in device infection rates with the use of prophylactic antibiotics for tunneled central venous catheters (CVC). While there are many confounding factors related to the infection rates of tunneled CVCs, antibiotic prophylaxis use in the placement of totally implanted venous access ports, has not been studied. Since catheter related infections (CRIs) often result in catheter removal, prolonged antibiotic therapy, delayed chemotherapy, and significant expense, we chose to study whether prophylactic antibiotics, given as a single dose preoperatively, would decrease the rate of early CRIs in totally implanted venous access ports.

Methods: This is a single center, retrospective review of two surgeons who place the majority of ports at a University hospital, using the same skin prep and operative technique. One surgeon routinely used a single preoperative dose of Cefazolin, while the other did not routinely use antibiotics. With IRB approval, data variables related to port placement were analyzed. We defined an early CRI as; a patient treated with antibiotics for port site induration, positive blood cultures, or suspicion of infection which led to port removal, within 30 days of port placement. Univariate statistical analyses were employed.

Results: Surgically placed ports from January 2007 to July 2009 were reviewed. A total of 392 ports were placed in patients requiring chemotherapy for a wide variety of malignancies. The mean age of patients was 55 (8#61617;14), 66% were female, and the mean BMI was 27.5 (8#61617;6.8). The mean preoperative WBC was 7.2 k/uL (8#61617;3.5), range (0.85-29.9). Preoperative antibiotics were given in 94 cases (24.0%) versus 298 (76%) cases with no prophylaxis. There were no differences in distribution of patients with respect to age, BMI, preoperative WBC, or number of site attempts based on either operating surgeon or antibiotic use. All early CRIs, a total of 8 (2%), occurred in patients not given antibiotics ($p=0.11$). Six of 8 (75%) infected ports were removed. The only factor significantly associated with CRI rate was venous cannulation attempts at multiple sites; 346 cases had a single insertion site (88.3%) with an early CRI rate of 1.4% and 46 (11.7%) had 2 or more insertion site attempts with a rate of 6.5%, $p=0.02$.

Conclusion: Contrary to the current literature, this study identified a trend toward significance for the use of prophylactic antibiotics in the prevention of early CRIs for port placement. Additionally, the data showed that attempting cannulation at multiple vein sites was related to an increased incidence of early CRI. We believe this review justifies consideration of a prospective, randomized trial of the use of preoperative prophylactic antibiotics for totally implanted venous access ports.

10. FIELD TRIAGE SCORE (FTS) FOR BATTLEFILED CASUALTIES: VALIDATION OF A NOVEL TRIAGE TECHNIQUE IN A COMBAT ENVIRONMENT

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Background: Tactical Combat Casualty Care (TC3) battlefield triage principles are based upon pulse character and mental status, neither requiring instruments. A weakly palpable or absent pulse correlates with a systolic blood pressure of <100 mmHg. The motor component of the Glasgow Coma Score (GCS-M) < 6 has been shown to correlate with adverse outcomes. In a previous study, we developed a simple triage tool, the Field Triage Score (FTS), based on pulse character and GCS-M in order to provide a quick and effective means of predicting injury survival in the civilian trauma environment. The purpose of this analysis was to validate the predictive utility of the FTS within the battlefield trauma environment.

Methods: The Joint Theater Trauma Registry (JTTR) was utilized to identify 4,992 battlefield casualties from Iraq and Afghanistan from January 2002 to September 2008 with requisite admission data elements of systolic blood pressure, Glasgow Coma Score-Motor (GCS – M) status and survival. Systolic blood pressure (SBP) was stratified as < 100 mmHg which was consistent with weak/absent pulse character or > 100 mmHg consistent with a normal pulse character. GCS-M stratified as either abnormal (< 6) or normal (= 6). Casualties with a presenting SBP=0 mmHg were excluded from the analysis. As in the civilian trauma triage study, the FTS was derived by assigning a component value of 0 for weak/absent pulse or an abnormal GCS-M and a component value of 1 for either a normal pulse or normal GCS-M. Adding the scores resulted in an aggregate FTS value of 0, 1 or 2. An FTS score of 1 could be obtained by either an abnormal pulse character with a normal GCS-M or a normal pulse character with an abnormal GCS-M. Statistics were done utilizing SPSS software (Version 12.0).

Results: For the overall population of 4,992 casualties, 87.5% ($n=4,366$) had an FTS score of 2. Only five of the casualties in this stratum died for a mortality of 0.1% (5 / 4,366). 10.8% ($n=540$) of patients presented with an FTS score of 1. The mortality rate of this group was increased to 6.1% (33 / 540). In sharp contrast, combat casualties presenting with an FTS score of 0 had a significantly higher mortality of 41.4 % (34 / 82) ($p < 0.05$).

Conclusion: In this analysis, we have retrospectively validated the utility of the FTS as a simple and practical triage instrument for use on the battlefield. Utilizing the FTS, medics and medical providers will have a quick and effective measure to predict high acuity combat casualties in order to triage care, evacuation and medical resources in austere military environments. This technique may have potential implications for domestic or foreign disaster or mass casualty situations in which supplies, medical resources, and facilities are limited.

11. RATIONAL TRIAGE OF FATAL GUNSHOT WOUNDS TO THE HEAD: EXPENSIVE FUTILITY OR A VITAL SOURCE OF ORGANS ?

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Background: Despite the devastating consequences of penetrating brain injuries, organ recovery for transplantation in this cohort is low, and costly admissions to the intensive care unit (ICU) are often futile in the face of non-survivable injuries. The impact of these factors is further underscored by current challenges of escalating health care costs in the face of diminishing resources. We hypothesized that a treatment algorithm could be developed to minimize futile care in this group and identify potential organ donor candidates.

Methods: A 5 year review of our level one trauma center's prospective data base for all patients sustaining a lethal gunshot wound (GSW) to the head was performed. Variables of interest included: age, sex, presenting emergency department (ED) Glasgow coma scale (GCS), presenting ED systolic blood pressure, ISS, CT findings, ICU length of stay and organ donation status.

Results: 68 patients with lethal penetrating head injuries were identified. Median age was 27.5, GCS= 3, and ISS= 26. 83% of patients were male. There was no significant difference in any variables, including lactate, base deficit, admission serum creatinine, or coagulation tests between donors and non-donors, although donors had a significantly higher mean SBP than non-donors. (112 mmHg vs. 57 mmHg, $p=0.03$) Mean hospital survival was 28.33 hours. Only 10 patients (14%) donated a total of 41 solid organs, while 58 patients (86%) were non-donors. Of these, 31 (53.4%) died in the emergency department (ED), but of note, 25 (43.1%) were transported to the ICU where they expired. Only 1 (1.7%) patient had a planned death on the surgical ward, while one other single patient died in the operating room. 54 (93.1%) of the non-donors and 9 (90%) of the donors were deemed nonviable by neurosurgical consultation in the ED based upon clinical and CT criteria. Of note, only 4 (16%) of those transferred to the ICU, who did not donate organs were considered to have potentially survivable injuries, while 1 (10%) patient of the donor group was thought to be potentially viable at presentation. Of the 58 non-donors, 40 (68.9%) were determined medically ineligible for organ donation; while in 16 (27.5%) consent for transplantation was not obtained. Furthermore, of 21 patients admitted to the ICU who subsequently failed to donate organs, 14 (66.6%) failed due to lack of consent.

Conclusion: Our findings confirm previous data suggesting that organ donation in patients sustaining fatal GSW to the head is infrequent. Despite this, patients are frequently transferred to the ICU from the ED even after non-survivable injuries are recognized at initial presentation. Prompt communication with family members regarding brain death status and emphasis on earlier inquiries regarding donor status could reduce futile ICU care and improve organ recovery in this cohort.

12. FULL TIME TRAUMA SERVICE LEADS TO IMPROVED LEVEL III TRAUMA CENTER OUTCOMES

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Background: Level III trauma centers are an effective component of a healthy trauma system; however, there are less outcomes data available for Level III trauma centers (compared to Level I and II centers). This study examines the effectiveness over time of a level III trauma center serving as the lead, regional trauma center in a predominately remote and rural region.

Methods: Data were reviewed from the trauma registry over a 12 year period. For analysis, the data are divided into two equal time spans, an Early period (1997-2002) and a Late period (2003-2008). The Late period corresponds to the implementation of a full time trauma service in the hospital. Trauma service implementation included dedicated trauma surgeons and extensive use of evidenced based care protocols. For a control, these data were also compared to outcomes from the National Trauma Data Bank (NTDB).

Results: A total of 8,689 patient outcomes were analyzed (3,709 Early, 4,980 Late). Demographics were similar between the respective Early and Late time periods: male gender-62% vs. 63%, blunt-86% vs. 88%, and age. There were 402 pts (10.8%) with an ISS > 15 in the Early period and 735 (14.8%) with an ISS > 15 in the Late period ($p < 0.01$). In those pts with ISS ≤ 15 , 49 of 3307 (1.5%) pts died in the Early period, and 74/4245 (1.7%) died in the Late period ($p=0.37$). In those with ISS > 15, 66/402 pts (16.4%) died in the Early period, while 81/735 (11.0%) pts died in the Late period ($p=0.01$). Despite the increased injury severity, overall mortality rates remained unchanged (Early = 3.0%, Late=3.1%) and were comparable to NTDB data (4.0%). Hospital length of stay was similar or improved in the Late period: ISS 1-8=Early 3.23 vs. Late 2.97 days; ISS9-15=Early 5.82 vs. Late 5.44 days; ISS 16-24=Early 10.02 vs. Late 7.83 days; ISS>24=Early 11.47 vs. Late 11.37 days.

Conclusions: Implementation of a full-time trauma service resulted in improved outcomes including a 33% mortality reduction in the severely injured. Level III regional trauma centers can achieve comparable results to Level I and II centers.

13. ABILITY OF CXR AND ABDOMINAL CT TO IDENTIFY TRAUMATIC THORACIC INJURY

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Background: Abdominal CT scan (ACT) is routinely used in the evaluation of trauma patients. Ease and accessibility of CT scanning has also led to increased utilization of thoracic CT scan (TCT). This has resulted in the identification of occult thoracic injuries (defined as those seen on CT only and not initial CXR) with little clinical significance. In the current healthcare economic condition, cost effective diagnostic evaluation is imperative. Yet physicians are hesitant to forego total body scanning due to convenience and the potential of missed injuries. Our aim was to assess the ability of chest x-ray (CXR) in combination with abdominal CT scan (ACT) to identify clinically significant thoracic injuries following trauma in comparison to that of TCT.

Methods: All patients with thoracic injuries that were evaluated by CXR, TCT and ACT from April to June 2007 were retrospectively reviewed. Thoracic injuries evaluated included pneumothorax, hemothorax, pulmonary contusion, rib fractures, aortic injury, and axial skeletal fractures.

Results: 374 patients were identified. ACT identified 100% (25/25) of occult hemothoraces. CXR and ACT identified 100% of clavicle, scapula and spinal fractures. ACT identified 65% (15/23) of occult pneumothoraces diagnosed on TCT. 53% (8/15) patients with occult pneumothoraces identified on ACT required tube thoracostomy, compared to 0% (0/8) of the patients with occult pneumothorax seen only on TCT ($p=0.009$). 64% (18/28) of occult pulmonary contusions were seen on ACT. None of the occult pulmonary contusions seen on TCT only resulted in ICU stay for respiratory complications. 58% (18/31) of occult rib fractures were identified by ACT. There were 5 thoracic aortic injuries. None was visualized on ACT. However, all patients with aortic injuries had an abnormal CXR and high risk mechanism.

Conclusion: CXR with ACT will identify the majority of significant intrathoracic injuries. Occult pulmonary contusions and pneumothoraces seen only on TCT did not require intervention or intensive care unit monitoring. This study suggests that for trauma patients whose evaluation includes ACT, TCT can safely be reserved for trauma patients with abnormal CXR and high risk mechanism for aortic injury.

14. BLOOD TRANSFUSION IS ASSOCIATED WITH INCREASED COMPLICATIONS IN MODERATELY INJURED PATIENTS

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Background: Blood transfusion has been associated with numerous complications in a variety of patient populations. Seriously injured patients receiving packed red blood cell (PRBC) transfusions have been noted to have an increased incidence of respiratory and infectious complications. The majority of reports that link blood transfusion to complications in trauma have focused on severely injured patients that present with hemorrhage and shock. Thus, the harmful impact of transfusion has potentially been masked by the severity of injury.

Methods: A retrospective review of injured patients with an ISS of 9-15 admitted to a Level 1 Trauma Center over a 5-year period was performed. Patients were stratified by ISS and transfusion history. Initial systolic blood pressure, Glasgow Coma Scale score (GCS), hemoglobin, and survival probability score were compared. Outcome measures assessed included ventilator requirements, ICU length of stay (LOS), hospital LOS, reported complications, and mortality.

Results: The records of 2332 patients were reviewed, of whom 208 (9%) received at least 1 transfusion. GCS and ISS were similar between the transfused and nontransfused groups. Transfused patients were older (56 vs. 40, $p<0.0001$), had lower initial systolic blood pressures (126 vs. 136, $p<0.0001$), lower initial hemoglobin (11.9 vs. 13.8, $p<0.0001$), and lower predicted survival (0.93 vs. 0.96, $p<0.0001$). Transfused patients did not have an increased ICU LOS or increased need for mechanical ventilation. Hemoglobin nadir was equivalent in the groups. The incidence of complications was higher in transfused patients (42% vs. 9%, $p<0.001$). The increased complication rate held when ISS 9-10, ISS 11-12 and ISS 13-15 subgroups were individually evaluated ($p<0.001$). The odds (OR) of developing complications for patients receiving 1-2, 3-6, and >6 units of blood was 3.9, 7.5, and 34.6, respectively ($p<0.001$). Complications associated with blood transfusion were DVT 1.4 vs. 0.1% ($p<0.001$), respiratory failure 10.1 vs. 0.9% ($p<0.001$), pulmonary embolism 1.0 vs. 0.1% ($p=0.015$), pneumonia 7.7 vs. 1.8% ($p<0.001$), wound infection 1.4 vs. 0.3% ($p=0.019$), urinary tract infection 7.2 vs. 0.9% ($p<0.001$), sepsis 1.9 vs. 0.1% ($p<0.001$), myocardial infarction 3.4 vs. 0.6% ($p<0.001$), cardiac arrhythmia 7.2 vs. 1.0% ($p<0.001$), stroke 1 vs. 0% ($p<0.001$), renal failure 4.8 vs. 0.0% ($p<0.001$), and ileus 7.1 vs. 0.9% ($p<0.001$). Patients that received transfusions had a much longer LOS (10.4 vs. 3.9 days, $p<0.0001$).

Conclusions: Moderately injured patients that received transfusions had a much greater incidence of complications. The association between transfusion and complications was dose dependent. Transfusion was most prominently associated with infectious, pulmonary and cardiac complications. These data provide further evidence of the potential deleterious effect of transfusions. Indications for transfusion in moderately injured patients should be carefully assessed.

15. ARTERIAL EMBOLIZATION FOR PELVIC FRACTURES AFTER BLUNT TRAUMA: ARE WE ALL TALK?

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Background: Pelvic fractures sustained after blunt trauma are often associated with arterial hemorrhage, however, the incidence and predictors for needing therapeutic arterial embolization are poorly understood. We hypothesized that arterial embolization for bleeding after pelvic fracture is used relatively infrequently, and sought to identify the incidence and true need for arterial embolization. We also sought to define injury patterns associated with successful therapeutic angiographic embolization in an attempt to provide information to clinicians regarding resource mobilization, particularly in level-2 and level-3 trauma centers.

Methods: A retrospective trauma registry review identified all patients admitted to our urban, Level-1 Trauma Center with pelvic fractures between January 1, 2000 and January 1, 2009. Patients requiring pelvic arterial angiogram and arterial embolization of pelvic bleeding were reviewed. Patients requiring arterial embolization were further stratified for pelvic fracture pattern and pelvic injury mechanism.

Results: During the 9-year study period there were 802 patients diagnosed with pelvic fractures, with only 31 patients (3.9%) requiring diagnostic pelvic angiography. Of those undergoing pelvic angiogram, 17 patients (54.8%) had active bleeding requiring arterial embolization. Positive angiographic findings were most commonly associated with pelvic fractures caused by a mechanism that resulted in lateral compression (76.5%). Of the patients treated with therapeutic arterial embolization, only 17% had pelvic injuries caused by a vertical shear mechanism.

Conclusion: While arterial embolization is an important treatment option for hypotensive patients sustaining blunt pelvic fractures with active pelvic hemorrhage, the actual need for angiography and therapeutic embolization is quite small. Although pelvic fractures caused by a vertical shear mechanism are cited as the mechanism most commonly associated with pelvic bleeding, we found that mechanism to be least associated with successful treatment using therapeutic angiography.

16. DOES MITOTIC RATE PREDICT SENTINEL LYMPH NODE METASTASIS OR SURVIVAL IN PATIENTS WITH INTERMEDIATE AND THICK MELANOMA?

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Background: Studies of the significance of mitotic rate (MR) have indicated that this prognostic factor is an important predictor of nodal metastasis and survival in patients with thin melanoma (<1 mm Breslow thickness); its significance in patients with intermediate and thick melanoma remains controversial. This analysis was undertaken to determine the impact of MR on intermediate and thick melanoma patient outcomes.

Methods: In this post-hoc analysis of a large prospective randomized clinical trial that included patients aged 18 to 70 years with melanoma \geq 1.0 mm Breslow thickness; all patients underwent SLN biopsy and completion lymphadenectomy if tumor-positive SLN were found. Kaplan-Meier (KM) survival analysis, univariate and multivariate analyses were performed to evaluate factors predictive of disease-free survival (DFS) and overall survival (OS).

Results: A total of 551 patients had MR reported in the standard nomenclature of mitoses/mm². The median follow-up was 60 months. A cut point of 6 mitoses/mm² best discriminated DFS and OS: 455 patients (82.6%) had MR <6/mm² and 96 patients (17.4%) had MR \geq 6/mm². SLN were tumor-positive in 14.7% and 31.3% of patients with MR <6/mm² vs. MR \geq 6/mm², respectively (p=0.0003, RR=2.12 (95% CI: 1.47, 3.07)). By KM analysis, there were significant differences in 5-year DFS (88.2% vs. 75.1%, p=0.0014) and 5-year OS (88.4% vs. 69.4%, p=0.0002) comparing patients with MR <6/mm² to those with MR \geq 6/mm², respectively. While on univariate analysis MR was a significant predictor of OS (p=0.0007), only gender, ulceration, lymphovascular invasion, and SLN status remained significant in the multivariate model (p<0.05).

Conclusions: Increased MR predicts SLN status for patients with intermediate and thick melanoma, although it is not an independent prognostic factor predicting survival.

17. THE LOWER INCIDENCE OF MELANOMA IN WOMEN MAY BE RELATED TO INCREASED PREVENTATIVE BEHAVIORS

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Background: Men have a higher lifetime incidence of melanoma than women. Hypothesis: The difference of melanoma incidence between men and women can be explained in part by preventive measures.

Design: Cross sectional population based study.

Patients and Methods: The National Health Interview Survey (NHIS) is conducted annually by the Centers for Disease Control and is designed to be representative of the American civilian population. Data from the 2005 survey were analyzed for gender differences in response to sun exposure and reported preventive measures among adults. SUDAAN software was used for analyses.

Results: There were 31,428 people surveyed representing 217,773,755 people over age 18 in the United States. Of these 13,762 (48.2%) were male and 17,666 (51.8%) were female. While women were more likely to report severe burning after 1 hour of sun exposure (8.7% vs. 5.4%, $p<0.001$) or after multiple sun exposures (13.4% vs. 8.2%, $p<0.001$), they also reported fewer sunburns per year than men (mean 0.7 vs. 0.9, $p=0.001$). Women were more likely to report always staying in the shade (11.2% vs. 6.2%, $p<0.001$), always using sunscreen (21.2% vs. 8.8%, $p<0.001$), using a higher SPF (>15) sunscreen when sunscreen was used (54.0% vs. 41.9%, $p<0.001$), and were more likely to report ever having had a skin exam (18.7% vs. 16.7%, $p<0.001$). However, women were nearly four times as likely to use a tanning bed as men (2.1 vs. 0.6 times per year, $p<0.001$), and were less likely to report always wearing a cap (7.3% vs. 25.3%, $p<0.001$), a hat (5.4% vs. 6.4%, $p<0.001$), a long sleeve shirt (3.8% vs. 4.9%, $p<0.001$), and long pants/skirt (10.6% vs. 19.8%, $p<0.001$) when in the sun than men. Still, women were 2.2 times more likely (95% CI: 2.1-2.4, $p<0.001$) to use a higher SPF sun block than men after controlling for the likelihood to burn with single or multiple sun exposures, time spent in the shade, number of sunburns in the past year, use of a cap, hat, long sleeved shirts, long pants /skirts, and frequency of tanning beds, and were less likely to report rarely or never staying in the shade than men controlling for all other factors (OR: 0.55; 95% CI: 0.5-0.6, $p<0.001$).

Conclusion: While men more often wear protective clothing and are less likely to use a tanning bed, women are more likely to avoid sun exposure and use sunscreen. The higher incidence of melanoma in men may be explained in part by an increased incidence of preventive measures taken by women.

18. RISK FACTORS ASSOCIATED WITH LOCAL AND IN-TRANSIT RECURRENCE OF CUTANEOUS MELANOMA

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Background: Local and regional recurrence in patients with cutaneous melanoma can be difficult to manage. Therefore, understanding the risk factors for local and in-transit recurrences may help facilitate methods of prevention, early detection, and treatment.

Methods: Prospectively collected data were reviewed retrospectively for 462 patients diagnosed with single lesion cutaneous melanoma. Follow-up time was at least 18 months. Clinical and pathological characteristics of the tumors were evaluated. Continuous variables were compared using the Two Sample T-Test while categorical variables were compared using Chi-Square tests.

Results: Out of the 462 patients evaluated, 255 patients had at least 18 months of follow-up. Twenty-six (10%) had local or in-transit recurrence (LR/ITR) and 229 did not. Of the 26 with recurrence, 8 were local, 14 were in-transit and 4 had both. Lymph node recurrence occurred concurrently in 54%. Patients with LR/ITR were older with a mean age of 74 years vs 61 years ($p=0.0002$), with 85% of the patients with LR/ITR and 16% of all patients being older than 65 years old. Patients with LR/ITR had thicker tumors with a mean Breslow's thickness of 3.6 mm vs 2.0 mm ($p=0.018$). The presence of angiolymphatic invasion was highly associated with the development of LR/ITR ($p<0.0001$). Increased tumor mitotic rate (TMR) was more common in the LR/ITR group but this factor approached but did not reach statistical significance ($p=0.0538$). It was more common for patients to develop LR/ITC if located on the extremity (64%) vs head and neck (32%) vs trunk (4%) but this did not reach statistical significance ($p=0.09$). Gender ($p=0.9447$), ulceration ($p=0.7981$), nodal status ($p=0.1824$), and the use of adjuvant therapy ($p=0.27$) were not associated with LR/ITR. On univariate logistic regression, age (especially age>65), thickness (especially thickness>2-4 mm and 4mm), TMR $\geq 11/\text{mm}^2$, and angiolymphatic invasion were all significant risk factors for LR/ITR. Multivariate logistic regression showed age>65, thickness>4.00 mm, and angiolymphatic invasion were the only significant risk factors.

Conclusions: Older patients with tumors thicker than 2 mm and higher TMR appear to be at higher risk for local and in-transit recurrences. Since pathologic features of melanoma have only recently been routinely reported, the number of patients in this analysis may be too few to generalize these results and further studies are warranted. In the mean time, however, such patients warrant consideration of preventative strategies and should receive close clinical follow-up for early recurrence.

19. PROSPECTIVE INTERIM ANALYSIS TO EVALUATE THE ROLE FOR PREOPERATIVE POSITRON EMISSION TOMOGRAPHY WITH COMPUTED TOMOGRAPHY (PET/CT) IMAGING AS A USEFUL ADJUNCT IN THE SURGICAL MANAGEMENT OF AXIAL T3 OR T4 CUTANEOUS MELANOMAS.

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Background: Sentinel lymph node biopsy (SLNB) is considered the gold standard for surgical staging and evaluation of lymphatic metastatic spread for melanomas. Axial tumors of the head, neck and trunk, however, remain a challenge for accurate sentinel node mapping (failure rate reported as high as 20%) given their multiple potential lymphatic drainage basins. Controversy exists regarding the role of PET imaging in preoperative melanoma staging with a lack of benefit suggested for patients with thin melanomas. The purpose of this prospective study is to evaluate the utility of preoperative F-18-FDG PET/CT in identifying metastatic disease for patients with axial T3 or T4 melanomas and to determine if PET/CT can alter surgical decision-making.

Methods: After IRB approval, a prospective cohort of 15 patients found to have biopsy-confirmed primary T3 or T4 axial melanomas with no clinically palpable metastatic lesions were enrolled in the study. Each patient received preoperative whole-body 18FDG-PET/CT imaging prior to surgical wide local excision (WLE) and SLNB. PET/CT data was then compared to SLNB and final pathology data using standard statistical analyses (SPSS 17.0) to determine sensitivity, specificity, and whether the results altered surgical management.

Results: For this interim prospective analysis, a total of 15 patients met the inclusion criteria for the study and were consented for participation. Mean age at diagnosis was 61.3 +/- 14.5 years. Ten patients had lesions confined to the head or neck and 5 patients had truncal lesions. Six patients had T4 lesions while 9 had T3 lesions. Mean Breslow depth was 4.5 mm (range 2.2 to 12.4 mm). Three patients (20%) had positive sentinel lymph nodes on histology (2 detected by frozen section analysis and one with micrometastasis on histology). There was one false negative PET/CT in a patient with micrometastasis which was also missed on SLNB frozen section analysis. PET/CT did however, correctly identify all macroscopic metastatic lesions in this study with a sensitivity and specificity equivalent to SLNB. It also detected occult metastatic disease in 2 patients (13%) not identified by SLNB (p=0.01; one with splenic metastasis and one with axillary lymph node metastasis), altering the surgical management in these patients.

Conclusions: Preoperative PET/CT imaging identified macroscopic nodal disease in all patients with axial T3 or T4 melanomas with a sensitivity and specificity equivalent to SLNB. It also detected occult metastatic foci in 13% of patients that would have been missed by SLNB alone, altering surgical management in these patients. These interim prospective data suggest that pre-operative PET/CT may have a useful role as an adjunct to SLNB in patients with thick (T3 or T4) axial melanomas, justifying the completion of a larger cohort study.

20. COMPUTERIZED CLINICAL DECISION SUPPORT IMPROVES SURVIVAL IN INTRA ABDOMINAL SURGICAL SEPSIS

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BACKGROUND: The evidence based management of surgical sepsis remains a significant challenge due to the number, complexity and time sensitive nature of the necessary interventions. In an attempt to improve this process, we have created a computerized clinical decision support (CCDS) program to facilitate the implementation of current evidence based guidelines for the management of surgical sepsis. The purpose of this study is to evaluate the impact of CCDS on mortality in patients with intra abdominal surgical sepsis.

METHODS: We evaluated our prospective Surgical Intensive Care Unit Sepsis Database from September 1, 2007 through September 30th, 2009 for all patients requiring abdominal surgery for treatment of intra abdominal sepsis. The database was queried for patient demographics, source of intra abdominal infection, APACHE II score, and hospital mortality. Patients were then grouped into the categories of sepsis, severe sepsis, and septic shock based upon American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference definitions. Observed mortality was then compared to predicted mortality based upon APACHE II score using Fisher's exact test. A p value of <0.05 was considered significant.

RESULTS: Of 230 patients, 87 required a surgical procedure for management of their intra abdominal sepsis. The average age of the cohort was 59 (\pm 17.0) and 39% were male. The ethnic breakdown of the cohort was: 60% Caucasian, 28.7% African American, 5.7% Hispanic, 3.5% Asian, 1.1% Indian, and 1.1% Pacific Islander. Of the 87 patients, 37 (42.5%) had septic shock, 40 (46%) had severe sepsis and 10 (11.5%) had sepsis. The sources of intra abdominal infection included colon (45%), small bowel (23%), stomach (10%), pancreas (7%), gallbladder (6%), other (6%) and appendix (3%). Of the patients that died, the colon was the source of intra abdominal infection in 59%. The average APACHE II score for the groups was as follows: septic shock 33.2 (\pm 6.7), severe sepsis 25.7 (\pm 9.0) and sepsis 15.1 (\pm 7.3). The overall actual mortality rate for the cohort was 24% compared to a predicted mortality based upon APACHE II of 62.5% (p value <0.0001). When comparing observed mortality to predicted mortality for the groups the results are as follows: septic shock actual mortality 40.5% vs. predicted mortality 79.1% (p = 0.0009), severe sepsis actual mortality 15% vs. predicted mortality 55.9% (p = 0.0002), and sepsis actual mortality 0% vs. predicted mortality 21.2% (p = 0.23).

CONCLUSION: The utilization of CCDS results in significantly improved survival in patients with intra abdominal surgical sepsis when compared with predicted survival based upon APACHE II.

21. OUTCOMES OF DAMAGE CONTROL CELIOTOMY IN ELDERLY NON-TRAUMA PATIENTS WITH INTRA-ABDOMINAL CATASTROPHES

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Objective: Damage control laparotomy, initially developed for trauma patients, has expanded into the general surgery arena. Little evidence exists regarding the utility of the open abdomen (OA) technique in elderly non-trauma patients. Our objective was to review the management and outcomes of this approach in elderly patients presenting with intra-abdominal catastrophes.

Methods: Retrospective chart review from 1998 to 2008 identified cases of emergency laparotomy with OA. Demographics, comorbidities, surgical techniques, morbidity, long-term disposition, and mortality were analyzed using two-tailed t-tests, ANOVA, Fisher's Exact Test, and Cox proportional hazards analyses.

Results: From a database of 210 patients with emergency surgeries, 88 (42%) patients with OA were identified, 33 (38%) were > 65 yoa and 55 (63%) were <= 65 yoa. Average APACHE IV for the elderly was 84 +/- 2 versus 68 +/- 2 for the younger group (p<0.001). Elderly patients had significantly higher comorbidities with respect to cardiovascular, pulmonary, and renal disease. When comparing the two groups, there were no significant differences in hospital or ICU lengths of stay or ventilator days. There were also no significant differences in complications, including pulmonary emboli, myocardial infarction, ventilator-associated pneumonia, urinary tract infection, tracheostomy, hernia, and long-term disposition. There was a trend towards increased catheter-related bloodstream infections in the elderly (p=0.071). Using Cox proportional hazards analysis, age was not an independent predictor of 30-day mortality.

Conclusion: Age is not an independent predictor of worse outcomes in patients managed by the open abdomen technique after intra-abdominal catastrophes. This management technique should be considered for elderly patients who require damage control celiotomy

22. OUTCOMES FROM TREATMENT OF NECROTIZING SOFT-TISSUE INFECTIONS: RESULTS FROM THE NSQIP DATABASE

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BACKGROUND: Necrotizing soft-tissue infections (NSTI's) are a group of uncommon, rapidly progressive, potentially fatal disorders which may be increasing in incidence. Although prompt surgery remains the mainstay of treatment, diagnosis may be difficult. Initial laboratory values [white blood count (WBC) >= 15,400/mm³ and serum sodium (Na) < 135 meq/L] have been advocated to distinguish NSTI's. Mortality rates of 15-40% have been quoted by small, single center reports. We used the large registry of the National Surgical Quality Improvement Project (NSQIP) to determine the current incidence, treatment, and outcomes of NSTI's.

METHODS: With IRB approval, we searched the NSQIP database for the years 2005-2008 using ICD-9 codes for necrotizing fasciitis, gas gangrene, and Fournier's gangrene (NSTI patients). For comparison, ten control patients (CON) with other diagnoses were randomly selected for each NSTI patient. Demographic, laboratory, surgical, and outcome data was collected for both groups.

RESULTS: The database yielded 688 patients with NSTI during the period reviewed (0.108% of the NSQIP database), and 6,880 CON patients were selected. NSTI patients had median age of 54 years (range 16 – 90 yrs), and 57% were male. Pre-existing diabetes was identified in 324 patients (47%), of whom 206 (64% of diabetics) used insulin. Other common conditions included hypertension (51%), smoking (35%), respiratory disease (23%), neurological disease (23%), and renal disease (19%). Altogether, 85% of patients with NSTI's had at least one comorbidity. Admitting WBC >= 15,400/mm³ occurred in 318 patients (48%), Na < 135 mEq/L in 274 (41%), and both in 145 patients (22%). The admission was listed as "emergent" in 406 cases (59%). A total of 552 patients (80%) had some manifestation of preoperative inflammation/ infection, including Systemic Inflammatory Response Syndrome (SIRS) in 121 patients (18%); sepsis in 249 (36%), and septic shock in 182 (26%). Patients underwent a median of 1 operation (range 1 - 5 operations). Overall mortality was 12% (84 patients) compared to 2% for the sample, and median LOS (survivors) was 18 days (range 0 - 231 days), compared to 2 days for CON (both p < 0.0001). In multivariate logistic regression age, dialysis, the occurrence of preoperative and/or postoperative septic shock, and prior cancer correlated with mortality. These relationships remained true when only "emergent" cases were analyzed.

CONCLUSIONS: NSTI's remain uncommon, but are seen regularly in academic surgical centers. Laboratory values said to be diagnostic are not sufficiently consistent to be useful in ruling out necrotizing infection. Despite a high incidence of pre-morbid conditions—particularly diabetes—and frequent presentation with sepsis and septic shock, mortality is lower than previously reported from single series. These patients require major resource consumption. These results can be used to benchmark outcomes for quality assurance.

23. ACCESSIBLE AUTOGENOUS VASCULAR ACCESS FOR HEMODIALYSIS IN OBESE INDIVIDUALS USING LIPECTOMY

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Purpose: Vascular access by arteriovenous fistula (AVF) is the preferred method for hemodialysis and offers improved patency, lower mortality, morbidity, and cost than catheters or AV grafts. Obesity in the United States is common and adds complexity in establishing autogenous access. More extensive procedures in obese individuals such as vein transposition or elevation are reported, however, direct AVFs are created less commonly, and fewer of these access procedures are functional. This study reviews our experience with excision of subcutaneous tissue (lipectomy) overlying upper arm cephalic vein AVFs in obese patients.

Methods: Our database of consecutive vascular access patients was reviewed identifying all individuals undergoing a lipectomy for vascular access accessibility due to vein depth. The procedures were performed in an outpatient setting with local anesthetic and sedation. Cephalic vein depth was measured by ultrasound at 3 cm increments from the cubital fossa. Three sites were recorded for each patient immediately prior to lipectomy and the same sites measured after healing before the first cannulation. The upper arm cephalic vein was the targeted cannulation site in all patients. A lipectomy was performed during the same operation as the AVF creation when the cephalic vein was ≥ 6 mm. The AVF was created first and a lipectomy performed 4-6 weeks later if the vein was < 6 mm. The proximal radial artery was used for arterial inflow when feasible. Incisions were selected to avoid later cannulation through the surgical scar.

Results: Mean BMI was 35.9 (28.0 to 57.7). Seventeen patients were female and mean age was 54 years (38-80 years). Eight patients had previous vascular access operations. Diabetes was the cause of renal failure in thirteen individuals. Lipectomy was performed during the same operation as AVF creation in four patients and as a staged procedure in 16 individuals. Three access depth location measurements resulted in a total of 60 measurements recorded preoperatively and repeated prior to the first cannulation. The preoperative mean depth of the cephalic vein in the upper arm was 16 mm (6-24 mm). This was reduced to a mean depth of 4 mm (3-8 mm) ($P \leq 0.01$). All fistulas were functional and able to be cannulated with mean time to cannulation after lipectomy of five weeks. Nine patients required an interventional procedure (angioplasty). One fistula failed at 8 months. There were no wound infections or complications. Mean follow-up was 10 months (2-49 months).

Conclusions: Lipectomy offers a relatively simple method of extending direct autogenous vascular access to obese individuals while avoiding more extensive procedures such as vein transposition or elevation. All fistulas were accessible. Only one AVF failed in the 20 patients reported with mean follow-up of 10 months.

24. USE OF AN ANATOMIC MARKING FORM AS AN ALTERNATIVE TO THE UNIVERSAL PROTOCOL FOR PREVENTING WRONG SITE, WRONG PROCEDURE, AND WRONG PERSON SURGERY

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Introduction: The Universal Protocol for Preventing Wrong Site, Wrong Procedure and Wrong Person Surgery (UP) was implemented by the Joint Commission (JC) in July 2004 in response to a progressive increase in the incidence of these sentinel events. It mandates a pre-procedure verification process, marking of the procedure site to be personally performed by the operating surgeon, and performing a 'time out' immediately before the start of a procedure. The UP applies to all accredited hospitals, ambulatory care and office-based surgery facilities. Despite good intentions, the UP requirements are cumbersome to surgeons, due to the inherent characteristics of surgical workflow processes.

Methods: Following the Wrong Site Surgery Summit hosted by the Joint Commission in 2003, our physician leadership, peri-operative nursing staff, and members of the Hospital Quality Department, developed an innovative anatomic marking form (AMF), which serves as a surrogate for patient marking. The AMF is signed by the patient and surgeon and accompanies the surgical consent. The patient is marked on the day of surgery by the peri-operative nursing staff in accordance with information on the form. This alternative process to the UP was proposed to and accepted by the JC, and was embraced by surgeons and surgical support staff.

Results: The AMF has been utilized on more than 112,500 patients over 4 ½ years, with a high degree of satisfaction from surgeons and nursing staff. During the study period, there was a single case of wrong site surgery resulting in excision of a skin lesion adjacent to the intended excision site and requiring a second procedure. Upon review, the case was found to be the result of an implementation error, where the AMF was not used as designed. This corresponds with the published incidence of wrong site surgery of 1 in approximately 100,000 non-spine operative cases.

Conclusion: Wrong site surgeries represent approximately 13 % of the 5901 sentinel events reported to the Joint Commission from between 1995 and 2009. This alternative process for surgical site marking represents a practical improvement in pre-operative care. The tool relieves surgeon from interrupting work flow to personally mark patients in the pre-operative period, while preserving patient safety. Approval of the AMF process illustrates a willingness by the JC to grant an exception to its own mandates, when the exception is consistent with the National Patient Safety Goals.

25. APPENDICITIS OUTCOMES ARE BETTER AT RESIDENT TEACHING INSTITUTIONS: A MULTI-INSTITUTIONAL ANALYSIS

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Purpose: In this era of heightened emphasis on patient outcomes, it is important to document the effect of residents acting as the surgeon for a surgical procedure. This study compares the outcomes of appendicitis between teaching and nonteaching institutions.

Methods: A retrospective review of all appendicitis cases > 18 years of age was performed from 1998-2007. The outcomes from two teaching institutions (each with its own General Surgery residency program) were compared to 11 nonteaching institutions. Study outcomes included postoperative morbidity and length of hospitalization (LOH). Data were analyzed using Wilcoxon rank-sum test and chi-squared analysis.

Results: 3242 patients were treated at the teaching institution (mean age= 41, male= 61%) and 14,483 at the nonteaching institutions (mean age= 38, male=54%). The perforated appendicitis rate was 29% at the teaching institution and 28% at the nonteaching institution (p 0.2). Data are summarized in the table.

	Teaching	Nonteaching	p
Non-perforated appendicitis (n)	2289	10385	
Wound infection	2.7%	2.3%	0.3
Abscess drainage	0.4%	1%	0.02
Readmission within 30 days	1.7%	3.5%	<0.0001
LOH (days)	1.7+1.5	1.8+1.6	0.002
Laparoscopic appendectomy	48%	68%	<0.0001

Perforated appendicitis- operative (n)	953	4098	
Wound infection	4.8%	7%	0.03
Abscess drainage	4.9%	10%	<0.0001
Readmission within 30 days	4.2%	8.4%	<0.0001
LOH (days)	5+4.2	5.2+3.1	0.3
Laparoscopic appendectomy	23%	42%	<0.0001

Perforated appendicitis- nonoperative (n) 10% 6% <0.0001

Conclusions: Teaching institutions were more likely to perform appendectomy using an open technique and manage perforated appendicitis nonoperatively. Infectious complications and readmission rates for both perforated and non perforated appendicitis were lower at teaching institutions.

26. THE EFFECT OF TIME OF DAY DURING WHICH DUTY HOURS ARE COMPLETED ON SURGERY RESIDENT PROFICIENCY

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Background: In an effort to reduce fatigue-related medical errors thought to occur primarily during the night time, training programs have instituted rotations during which patient care responsibilities are assumed by house officers assigned solely to night-time duties alone ("night float" rotations). Yet there is a dearth of data available to demonstrate whether strategies such as these will in fact provide the sought after benefit of reducing medical error. This study was designed to define the effect of restricted night time duty hours on psychomotor (P) and cognitive (C) skills of residents.

Methods: Simulations were first created using a visio-haptic joystick attached to a surgical instrument ("tool") that allows realistic interactions. Wearing motion tracking gloves, residents were tasked with grasping a series of virtual rings and placing each on pegs. This psychomotor task was modified to include cognitive (e.g. memory, orientation) evaluation. Junior level surgery residents performed ring transfer tasks prior to (baseline), and following, similar length day time (0600-1800 hrs, n=7) or night time (1800-0600, n=7) call. Residents completed three sessions per week for four weeks. Surgical proficiency was established using five metrics: hand movement smoothness (P); tool movement smoothness (P); time to task completion (P); gesture level proficiency (P/C); cognitive errors (C). Data (percent change from baseline, precall) were subjected to within and between group comparisons using ANOVA.

Results: There was no difference in surgical proficiency between the two groups when the aforementioned psychomotor and cognitive skill metrics were sampled before initiating call. However, both groups experienced significant (p<0.05) declines in virtually each of the skill metrics by the end of call. Moreover, those post call decrements in skill sets were each significantly (p<0.05) more dramatic in the group taking call at night versus the day time call group: hand movement smoothness (15% + 1.3% decline after night call v 10% + 0.9% after day call); tool movement smoothness (17% + 1.2% decline after night call v 9.8% + 2.3% after day call); gesture level proficiency (21% + 3.3% decline after night call v 16% + 2.1% after day call); and, cognitive errors (20% + 2.3% increase after night call v 15% + 2.1% after day call). It was as well interesting to note that both groups took significantly less time to complete the tasks at the end of their duty hours time to complete task (7% + 3.2% decrease after night call and 3.4% + 1.2% after day call); suggesting a tendency to complete tasks in a more rapid manner post-call, albeit with a concomitant increased error rate.

Conclusion: Deterioration of surgical proficiency is to a degree dependent upon the time of day during which call occurs, not solely upon the length of the call period-- calling to question some of the recommendations offered by the Institute of Medicine regarding resident duty hours.

27. A COMPREHENSIVE ANALYSIS OF SURGICAL PROCEDURES IN RURAL SURGERY PRACTICES

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BACKGROUND: Current data regarding practice patterns of general surgeons is commonly based on inpatient databases, often derived from larger databases which use second and thirdhand information. This data does not provide an accurate reflection of current practice patterns in rural surgery. We sought to better characterize rural surgery practice by creating a comprehensive database of all procedures performed by rural surgeons in North and South Dakota.

METHODS: All general surgeons in North and South Dakota were identified by the respective American College of Surgeons databases. Rural urban commuting area (RUCA) codes were used to identify surgeons practicing in rural areas. Rural surgeons were asked to provide a list of all current procedural terminology (CPT) codes from clinic, outpatient and inpatient procedures performed during calendar year 2006. CPT codes were converted to clinical classification software (CCS) codes and analyzed using Excel and SPSS.

RESULTS: Data was obtained from 43 of 53 surgeons who met inclusion criteria (81% response rate). 46,052 CPT codes were obtained and analyzed. Rural surgeons averaged 1071 procedures/year. "Classic" general surgical procedures including alimentary tract, breast, hernia and anorectal operations made up 25.6% of procedures performed by rural general surgeons. Endoscopic procedures comprised 39.8% of rural general surgeon caseload, while an additional 12.3% of procedures were classified as surgical subspecialty procedures (Ob/Gyn, orthopedic, cardiothoracic, etc.). Skin and soft tissue procedures together with endoscopy made up 57.6% of procedures performed by rural general surgeons. Surgeons practicing in small rural areas (population < 10,000) averaged 1345.8 procedures/year compared to 987.7 procedures/ year performed by surgeons practicing in large rural areas (population between 10,000 and 50,000). Surgeons practicing in large rural areas were more likely to perform procedures on the following organs systems: endocrine (odds ratio, 4.80; 95% confidence interval 2.52-9.17), esophagus/stomach (OR, 4.67; 3.59-6.08), vascular (OR, 3.28; 2.87-3.76) breast (OR, 2.57; 2.28-2.89) and liver/pancreas (OR, 2.37; 1.56-3.60). Surgeons practicing in large rural areas were less likely to perform procedures in the following categories: Ob/Gyn (OR, .26; .23-.30), orthopedics (OR, .39; .34-.45) and anorectal (OR, .55; .49-.61).

CONCLUSION: This study is the first to comprehensively describe the diverse inpatient and outpatient practice of rural general surgeons based on firsthand procedural data. Rural surgeons perform a high volume of procedures with endoscopic and minor surgical procedures comprising over 55% of their practices. Significant differences exist in the type and volume of procedures performed by surgeons practicing in small and large rural areas. Understanding rural general surgeon caseload is necessary to guide training of the next generation of rural general surgeons and develop the framework for delivering effective surgical care to rural populations.

28. METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS SCREENING AND ERADICATION IN THE SURGICAL INTENSIVE CARE UNIT. IS IT WORTH IT?

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Background: Methicillin resistant Staphylococcus aureus (MRSA) infections in the surgical intensive care unit (SICU) are common and difficult to treat. In an effort to decrease the incidence of MRSA in the SICU, a screening and eradication program was begun in Oct. 2008. Every patient admitted to the SICU has a nares swab culture for MRSA performed. If that culture is positive, the patient receives mupirocin ointment nasal swab twice a day for seven days.

Methods: This program is reviewed. Data collected includes all MRSA positive and negative nares and sputum cultures (N+MRSA, N-MRSA, S+MRSA and S-MRSA) and the cost of this screening and eradication. The data is analyzed to determine the rate of S+MRSA in N+MRSA patients the rate of S+MRSA in N-MRSA patients, the effectiveness of MRSA eradication and whether it is worth the cost.

Results: From Oct. 2008 through Oct. 2009 there were 145 patients admitted to the SICU who had nares cultures. Mean age is 58+21 years and 74% are male. Mean length of SICU stay was 11+10 days, median 7 days. Overall, the N+MRSA rate is 30/145 (21%) and the S+MRSA rate is 26/145 (18%). All 30 patients with N+MRSA received the eradication regimen. Followup nares culture is documented in only eight and three of the eight are N+MRSA. Of the 30 N+MRSA, 14 (47%) have S+MRSA with five of them occurring less than one day after SICU admission. This 47% rate of S+MRSA in N+MRSA patients is significantly greater ($p < 0.0001$) than the rate of 12 S+MRSA in the 115 N-MRSA (10%). This remains true even if the five S+MRSA that occurred within one day of admission are excluded, leaving 8 S+MRSA in 30 N+MRSA (27%) versus 12 S+MRSA in 115 N-MRSA (10%), $p = 0.02$.

The cost of this MRSA program includes the cost of the nares culture, \$5, and the cost of the mupirocin, \$40. The total cost for these 145 patients is \$1,925. The best case scenario is that 63% (5/8) or 19 of the 30 N+MRSA were eradicated and that if eradicated, a S+MRSA that occurs greater than one day after SICU admission is associated with N-MRSA. Thus the 30 N+MRSA are decreased to 19 and the N-MRSA group is increased to 126. The S+MRSA rate in the N+MRSA group is then 8/19 or 42% and 12/126 or 10% in the N-MRSA group. Without eradication all 30 N+MRSA would be exposed to this 42% rate which would produce 13 S+MRSA, an increase of five. Thus, in this best case scenario, \$1,925 prevented five S+MRSA which is \$385 per S+MRSA prevented.

Conclusion: In this SICU the rate of MRSA positivity in routine nares cultures is 21%. The incidence of MRSA positive sputum in those with MRSA positive nares is significantly greater than in those with MRSA negative nares. Screening for MRSA is

inexpensive. The eradication regimen, though inexpensive, is not fully effective. With such a high rate of MRSA, further clinical effort should be done to establish effective MRSA eradication. Then more research will be required to conclusively demonstrate that such eradication is beneficial.

29. TIME AND DEGREE OF GLYCEMIC DERANGEMENT ARE ASSOCIATED WITH INCREASED MORTALITY IN AN ICU PRACTICING TIGHT GLUCOSE
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Background: Tight glyceemic control (TGC) may reduce mortality and complications in critically ill trauma patients. Although TGC has become common practice, recent data have raised concerns about the risks of this strategy. We hypothesize 1) that euglycemia is beneficial; 2) that different methods for measuring the effect of TGC predict mortality disparately, and 3) that a measure integrating both time and amplitude of glucose derangement is most associated with mortality.

Methods: We examined all trauma patients (ISS>9) admitted to the ICU >3 days at a Level 1 trauma center (with an established TGC protocol to maintain glucose between 80-110 mg/dl) from 1/2005 to 12/2007. Data included glucose values, ICU length of stay (LOS) and disposition. Hyperglycemia was defined as any value >110mg/dL; and hypoglycemia < 80 mg/dl. Glucose parameters assessed were ICU admission values, average morning glucose (0600), average daily glucose, amount of time in the hyperglycemic, hypoglycemic and euglycemic ranges, and area of interpolated curves above and below the 80-110 mg/dl range. Logistic regression models were used to assess associations between glucose measures and mortality with and without adjustment for age, ISS, and admission GCS.

Results: Of the 546 patients identified, 68 (13%) died. Mean \pm SD LOS was 23 \pm 24 days (median 16), and mean ISS was 25 (median 24). 97,567 glucose measurements were analyzed with an average (\pm SD) of 179 \pm 211 per subject. ICU admission glucose, morning glucose, and average daily glucose were not associated with mortality. Time spent hyperglycemic (p=0.29) and hyperglycemic area under the curve (p=0.58) were not associated with mortality; however, hyperglycemic area/time (p=0.01) was adversely associated with mortality. Regarding hypoglycemia, area over the curve (p=0.009) and time spent hypoglycemic (p=0.002) were both associated with increased mortality.

Conclusions: In trauma patients treated with a tight glucose control protocol, duration of time and larger area of hyperglycemia considered together, but not independently, are associated with increased mortality. Both increased duration and degree of hypoglycemia were associated with mortality. A tight glucose control protocol controlling prolonged, high degrees of hyperglycemia, while avoiding hypoglycemia likely provides mortality benefit for trauma patients. Adjusting glucose control goal ranges to avoid hypoglycemia, while avoiding severe hyperglycemia may be of benefit to critically ill trauma patients.

30. EVALUATION OF EMPIRIC ANTIBIOTIC USE IN SURGICAL SEPSIS

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EVALUATION OF EMPIRIC ANTIBIOTIC USE IN SURGICAL SEPSIS

Background: Evaluation of our antimicrobial regimen for patients (pts) with surgical sepsis.

Methods: Our surgical intensive care unit (SICU) team has developed a sepsis management tool that utilizes computerized clinical decision support (CCDS) to implement evidence-based guidelines for the management of sepsis. The protocol includes an antimicrobial regimen based upon suspected source of infection. Our prospective, IRB approved database of pts managed with our CCDS sepsis management tool was analyzed. Pts were categorized into groups using standard definitions for sepsis (S), severe sepsis (SS), & septic shock (SSh). The primary objective was to assess the appropriateness of empiric antibiotic recommendations & determine if initial empiric antibiotics provided adequate coverage compared to final cultured organism sensitivity data (accuracy). An appropriate empiric antibiotic regimen is defined as one that covers all suspected organisms. Secondary endpoints included antibiotic protocol compliance, ICU-free days, & mortality. Groups were compared using t test, $p \leq .05$ significant.

Results: A total of 123 pts experienced 18 cases of S, 71 cases of SS, & 34 cases of SSh. The mean age of the pts was 58+16 years (range, 21 to 88 years). Sixty three (49%) pts were male & 72 (56%) pts were Caucasian. Appropriate antibiotics were prescribed in 101 (82%) pts. Of the culture positive pts, 56 (72%) received accurate antibiotics. The most common organisms not covered by empiric antibiotics based on final culture data were *Candida* sp. and antibiotic resistant gram negatives. ICU-free days were greater for pts in the compliant group (14.5 vs. 8.4, $p=0.014$). Hospital mortality was greater in patients that were non compliant with protocol recommendations (22% vs. 17%, $p=0.44$).

Conclusion: Our current antibiotic guidelines provide appropriate & accurate antimicrobial coverage for the majority of pts but additional empiric fungal coverage is needed to improve accuracy. Non compliance with the antibiotic protocol resulted in fewer ICU free days & increased hospital mortality in patients with surgical sepsis. These findings demonstrate a trend toward decreased ICU-free days & increased mortality related to antibiotic non compliance.

31. CAN SERUM B-TYPE NATRIURETIC PEPTIDE LEVELS PREDICT NEED FOR MECHANICAL VENTILATION AFTER INJURY?

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Background: B-type natriuretic peptide (BNP) is a neurohormone released from cardiomyocytes in response to volume expansion and increased ventricular wall tension. Increased serum BNP levels are associated with mortality in critically ill patients cared for in the medical intensive care unit. Additionally, serum BNP levels may serve as a biomarker for excessive fluid resuscitation after injury. The utility of serum BNP levels as a prognosticator of outcomes after injury has not been previously described. The purpose of this study was to describe the change in serum BNP levels over the first 48 hours after injury and determine if there was a correlation between serum BNP levels and outcome after injury.

Methods: In this prospective observational cohort trial, serum BNP levels were followed in injured patients admitted to the surgical intensive care unit (ICU). Levels were obtained at admission to the emergency room and at 12, 24, and 48 hours. Change in serum BNP levels from baseline were calculated for each time point (delta BNP). Max BNP was defined as the highest BNP level at any time point. Demographic information was also collected including age, gender, injury severity score (ISS), vent days, ICU length of stay (LOS), hospital LOS, net fluid balance at 48 hours, and ICU mortality. Spearman's rank order correlation coefficients or point bi-serial correlation coefficients were determined for serum delta BNP levels and outcome measures (mortality, vent days, ICU LOS, hospital LOS).

Results: 44 ICU patients were prospectively enrolled. 36 patients (82%) were male and 30 patients (68%) required mechanical ventilation. Mean age was 40.2 years. Median ISS was 22 [9, 29] and overall mortality was 14%. Mean baseline BNP was 48.0 +/- 66.1 pg/ml (range 10 – 274 pg/ml). Mean max BNP was 151.3 +/- 158.1 pg/ml. Net fluid balance at 48 hours post admission ranged from -35cc to +33 liters. Delta BNP at 24 hours correlated with number of days on mechanical ventilation (spearman's rho 0.428; $p=0.007$). Delta BNP at 12 hours correlated with need for mechanical ventilation (point bi-serial correlation 0.409; $p=0.009$). However, net fluid status at 48 hours post admission did not correlate with any BNP measurement.

Conclusions: Changes in serum BNP levels over the first 48 hours of ICU admission may have prognostic value in determining the need for mechanical ventilation in patients admitted to the ICU after injury. Additionally, the correlation between serum BNP levels at 48 hours and mechanical ventilation requirements is not solely due to resuscitation volume. Further work on the prognostic value of serum BNP levels after injury is warranted.

33. A COMPARISON OF RECURRENCE RATES IN PRIMARY VERSUS DELAYED SKIN CLOSURE IN VENTRAL HERNIA DEFECTS RECONSTRUCTED WITH ACELLULAR DERMAL MATRIX

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Introduction: Although complex abdominal wall defects can be successfully reconstructed with acellular dermal matrix (AlloDerm), hernia recurrence rates remain high. Immediate skin closure after bioprosthetic reconstruction is ideal but not always possible. The purpose of this study was to assess the impact of skin closure timing on hernia recurrence.

Methods: All patients who underwent abdominal wall reconstruction with acellular dermal matrix (n=52) were stratified into three groups, determined by timing and method of wound closure – primary closure at the time of bioprosthesis placement, complete healing by secondary intention, and healing by secondary intention followed by skin graft placement. All data were analyzed using the Student's t-test and the chi-square test.

Results: Twenty of 52 patients (38%) underwent primary skin closure immediately after reconstruction. Seventeen patients (33%) healed by secondary intention in a median of 3.8 months. Fifteen patients (29%) underwent delayed closure with split-thickness skin grafts after healing by secondary intention in a median of 5.4 months. There were four hernia recurrences in the primary closure group (21%), six recurrences in the secondary intention group (24%), nine recurrences in the group that underwent skin graft placement (60%). The delayed closure/skin graft placement group was more likely to recur when compared with the primary closure group ($p = 0.015$).

Conclusion: Hernia recurrence continues to plague bioprosthetic abdominal wall reconstruction. Delaying skin closure for a prolonged period of time is associated with an increased rate of hernia recurrence. Therefore delayed primary closure or early split-thickness skin graft placement after reconstruction should be performed.

34. COMPARISON OF OUTCOMES OF LAPAROSCOPIC AND OPEN APPENDECTOMY IN MANAGEMENT OF COMPLICATED OR PERFORATED APPENDICITIS

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Background: Although laparoscopic appendectomy is widely recognized to be superior to open appendectomy for management of acute uncomplicated appendicitis, the role of laparoscopy in management of acute complicated or perforated appendicitis remains undefined. This study examines and compares outcomes of laparoscopic appendectomy (LA) to open appendectomy (OA) in the management of acute complicated or perforated appendicitis.

Methods: The University HealthSystem Consortium (UHC) is an alliance of academic medical centers and affiliate hospitals. UHC's Clinical Data Base / Resource Manager (CDB/RM) allows member hospitals to compare patient-level risk-adjusted outcomes for performance improvement purposes. UHC database was utilized to access three-year discharge data from January 2006 to December 2008 for LA or OA using International Classification of Diseases (ICD-9) codes. Discharge data was classified by diagnosis of acute or perforated appendicitis and by severity of illness. Outcome measures included were mortality, morbidity, 30-day readmission, intensive care unit (ICU) admission, length of ICU stay, overall length of hospital stay and costs.

Results: A total of 40,095 patients underwent either LA or OA during the 3-year period. Overall, the laparoscopic group showed lower mortality index, significantly reduced length of stay and reduced costs. Following classification by diagnosis, patients undergoing LA for acute uncomplicated appendicitis showed significantly reduced length of stay (1.74 ± 2.33 for LA vs. 2.46 ± 4.11 days for OA) and a general trend towards lower morbidity. Although observed mortality was significantly less for the laparoscopic procedure, no significant difference in cost was observed between LA and OA for acute uncomplicated appendicitis ($\$7812 \pm 6014$ for LA vs. 7847 ± 13195 for OA; $p > 0.05$). Upon stratifying by severity of illness, open procedure was significantly cheaper for the minor severity patients whereas the laparoscopic procedure was cheaper for the major/extreme severity of illness patients. The laparoscopic group however, showed better outcomes across all severity groups. For patients with perforated or complicated appendicitis, laparoscopic group showed significantly lower observed mortality; significantly reduced length of stay (4.35 ± 4.84 for LA vs. 7.32 ± 9.46 days for OA; $p < 0.001$) and significantly reduced hospital costs ($\$12,130 \pm 14,474$ for LA vs. $17,623 \pm 28,146$ for OA; $p < 0.001$). Patients undergoing laparoscopic appendectomy for perforated or complicated appendicitis showed better outcomes than open appendectomy patients even after stratification by severity of illness.

Conclusion: This multi-center analysis of outcomes of laparoscopic appendectomy showed that laparoscopic appendectomy is safe and offers equal to or better outcomes compared to open appendectomy. These data suggest that laparoscopic appendectomy should be the procedure of choice regardless of appendicitis diagnosis or severity of illness.

35. COMPLICATED JEJUNAL DIVERTICULOSIS: OPTIONS FOR EMERGENCY MANAGEMENT

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Background: Jejunal diverticula are rare entities that are usually found incidentally. They are most often asymptomatic but presenting symptoms are non-specific and include abdominal pain, nausea, diarrhea, malabsorption, bleeding, obstruction, and/or perforation. Our objective was to detail our experience with the emergency management of complicated jejunal diverticulosis.

Methods: A retrospective review of medical records between 1999 and 2009 at a tertiary referral center was conducted to identify patients requiring emergency management of complicated jejunal diverticulosis. Complications were defined as those that presented with inflammation, bleeding, obstruction, or perforation.

Results: Sixteen patients presented to the emergency department with acute complications of jejunal diverticulosis. Ages ranged from 47 to 86 years (mean 72). Six patients presented with evidence of free bowel perforation. Six had either diverticulitis or a contained perforation. The remaining 4 were found to have gastrointestinal bleeding. Thirteen of the patients underwent surgical management (11 open jejunal resections, 1 laparoscopic jejunal resection, 1 open stapled diverticulectomy). Three patients were successfully managed non-operatively. There was one death in the study period and no other major complications. Mean follow-up was 35.6 months with 2 patients lost to follow-up. Five were seen for a single follow-up visit (mean = 16 days after discharge). There were no known reoccurrences during the follow-up period.

Conclusion: Complications of jejunal diverticulosis present a diagnostic and therapeutic challenge for the acute care surgeon. While non-operative management can be successful, most patients should undergo surgical intervention. Traditional management dictates laparotomy and segmental jejunal resection. Diverticulectomy is not recommended due to the risk of staple line breakdown. The entire involved portion of jejunum should be resected when bowel length permits. Laparoscopic techniques are an option but our current reported experience is limited.

36. ROLE OF GASTROGRAFIN IN MANAGING PATIENTS WITH SMALL BOWEL OBSTRUCTION

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Background: Management of patients with adhesive small bowel obstruction remains controversial. The diagnostic and therapeutic value of gastrografin has been widely reported. We established an institutional protocol using gastrografin to assess its utility in the management of adhesive small bowel obstruction.

Methods: The charts from 162 patients (M:F=103:59, median age=48 years (range 15-87)) with adhesive small bowel obstruction from 9/2004 to 7/2009 were retrospectively reviewed. Sixteen (10%) patients required urgent surgery. The remaining 146 patients were given gastrografin as part of a protocol (n=72, 49%) or treated expectantly (n=74, 51%). The protocol consisted of an abdominal CT scan followed by administration of 100 ml of gastrografin. Progression of gastrografin was assessed by serial X-rays. Failure of contrast to reach cecum within 24 hours was an indication for operative intervention. The need for operative intervention, bowel resection, length of stay, and mortality were compared between the two groups.

Results: A total of 67 patients required an operation and 23 (34%) needed bowel resection. The gastrografin protocol did not have significant effect on the need for operation (38.9 vs 48.9%, p=0.09), bowel resection (21.4 vs 38.6%, p=0.06), or mortality (1.4 vs 4.4%, p=0.26). Median length of stay in patients receiving gastrografin protocol was 5 days (range 1-54) compared to 6 days (range 1-101) for the expectant management group. There were no adverse effects seen with the use of the gastrografin protocol. There were 5 mortalities (3%): 1 in gastrografin group and 4 in the expectant group. Significant predictors for mortality were malignancy, presence of a transition point on CT scan, and operation requiring bowel resection (p<0.05). A transition point was also found to be a significant predictor of the need for operation (61.2 vs 41.1%, p=0.01).

Conclusion: The use of gastrografin in the management of adhesive small bowel obstruction is safe and is associated with reduced length of stay, need for surgery and bowel resection in the clinical setting. Lack of statistical significance may be due to a small sample size and warrants further study. CT scanning is an important part of the management protocol as the presence of a transition point portends worse outcome.

37. DOES OPERATIVE DURATION AFFECT PERIOPERATIVE OUTCOMES AFTER PANCREATICODUODENECTOMY?

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Background: Historically, pancreaticoduodenectomy (PD) has been portrayed as a lengthy and morbid procedure. Contemporary experience with PD has shown improvements in both operative times and perioperative complication rates. The goal of this study was to compare perioperative complication rates and severities as a function of operative time for patients undergoing PD.

Methods: Review of our prospective hepato-pancreato-biliary database identified 281 patients who underwent PD from December 2002 to June 2009. Clinicopathologic correlates, operative data, length of stay, 90-day complications and grade of complications (grade 1, minor; to grade 5, death) were reviewed to investigate any association with operative duration. The Pearson Chi-Square test was used to compare outcome.

Results: The most common indications for PD were pancreatic adenocarcinoma (57%), neuroendocrine tumors (8%), chronic pancreatitis (7%) and ampullary tumors (7%). Post-operative complications of any grade developed in 56% of patients after PD. Of these, 37% were grade 3 or higher, with two postoperative deaths (0.7%). When compared to those patients without complications, patients with complications were similar with regard to blood loss, perioperative transfusion rate, and need for vascular reconstruction. The median operative time for all patients was 240 minutes (range: 120-480). When comparing the proportion of patients developing complications at different hourly cutoffs, 22 % of patients undergoing PD lasting <=4 hours had a major complication (grade >=3), compared with 40% of patients undergoing operations lasting >4 hours (p = 0.01).

Conclusion: Perioperative complications after PD have decreased over time, as have operative times. We demonstrate an association between longer operative times and the occurrence of major complications. Operative duration may serve as a useful surrogate marker for decreased perioperative morbidity.

38. MINIMALLY INVASIVE ESOPHAGECTOMY- INCREASING THE SURGICAL OPTIONS FOR MANAGING ESOPHAGEAL CANCER

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Background: The incidence of esophageal cancer continues to increase. While the optimal treatment strategy continues to evolve, surgery continues to play a role in the multimodality approach to this disease. Increasingly this is being done in a minimally invasive fashion. This report describes our initial experience with minimally invasive esophagectomy.

Methods: A retrospective chart review was performed. 40 patients have undergone a minimally invasive esophagectomy (MIE) since 2003. 33/40 were fully minimally invasive while 7 were hybrids of VATS/laparotomy. One conversion was due to the need for a colon interposition. All had a cervical anastomosis. 39/40 were performed for esophageal cancer. The remaining case was for high grade dysplasia. There were 28 men and 12 women. The mean age was 63.7 years (range 40-85). 73% of the patients were over the age of 60. 28/39 patients with esophageal cancer received preoperative therapy. 26/28 received chemotherapy and radiation.

Results: The operative mortality was 2.5%. The only death occurred in a 78 year old with esophageal cancer who received preoperative chemotherapy and radiation. He developed C. difficile colitis and required a total colectomy. He died from multiorgan failure. The anastomotic leak rate- radiographic and clinical, was 22.5%. All were managed nonoperatively and resolved. Atrial fibrillation developed in 11/40 patients. Recurrent nerve injuries were seen in 4 patients. Two of these were permanent. A chyle leak also developed in 4 patients. 2 required surgical ligation of the duct. There were 2 airway injuries. One was recognized intraoperatively and repaired. The other presented as a late gastrotracheal fistula. This was repaired primarily and buttressed with a muscle flap. Overall the median length of stay was 13 days (range 7-70).

Conclusion: Minimally invasive esophagectomy is another surgical option in the management of esophageal cancer. It can be accomplished with a low mortality, even in an elderly population. Careful attention must be paid to the airway, thoracic duct and recurrent laryngeal nerve to further minimize morbidity. In our experience this minimally invasive approach has not yet led to a shorter hospital stay.

39. CLINICAL MANAGEMENT OF OCCULT HEMOTHORAX – A PROSPECTIVE STUDY OF 81 PATIENTS

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Background: The increasing use of thoracic computed tomography(CT) has led to the recognition of intrapleural blood not initially evident on admission plain chest x-ray, defining the presence of occult hemothorax. Although the clinical approach to occult pneumothorax has been well studied, the treatment of occult hemothorax, specifically the role of tube thoracostomy, has been less clearly defined. This study was designed to define the need for tube thoracostomy in the clinical management of occult hemothorax.

Methods: During the recent 12 month period ending September 2009, comprehensive data on 81 blunt trauma patients with occult hemothorax were recorded to determine whether tube thoracostomy was needed in the management of this injury and, if not, to define the consequences of non-drainage. Hemothorax was quantified on CT by measuring the deepest lamellar fluid stripe at the most dependent portion of the fluid collection, allowing comparisons among patients in the study group. Data included demographics, injury mechanism and severity, co-existing chest injuries, need for mechanical ventilation, hospital length of stay, complications and outcome. Indications for tube thoracostomy were recorded as well as the incidence of pneumonia, and empyema.

Results: Tube thoracostomy was successfully avoided in 67 patients (83%). Indications for placement of a chest tube in 14 patients included x-ray evidence of progression of hemothorax (8), respiratory compromise with oxygen desaturation (4), and delayed development of hemothorax in two patients. These patients were discharged with a clear chest x-ray but returned with x-ray evident hemothoraces requiring tube thoracostomy. One patient suffered a parenchymal lung injury from tube placement and underwent thoracotomy. Mechanical ventilation was used in 19 patients, 6 patients developed pneumonia, none empyema. There were two deaths (mortality=2.4%). Patients with a maximum intrapleural fluid thickness > 1.5 cm were 4 times more likely to require tube thoracostomy. Of interest, 41 patients had co-existing occult pneumothorax (51%) confirmed by CT. Age, mechanism of injury, injury severity score (ISS), need for mechanical ventilation, presence of pulmonary contusion, number of rib fractures, or presence of occult pneumothorax were not predictive of the need for intervention.

Conclusion: Occult hemothorax can be successfully managed without tube thoracostomy in most cases. Although CT detected fluid collection measuring > 1.5 cm increased the likelihood of need for tube thoracostomy, chest tubes in the management of occult hemothorax should be placed only for specific indication. Mechanical ventilation is not an indication for chest tube placement in patients with occult hemothorax. An accompanying occult pneumothorax may be expected in 50% of cases, but did not affect clinical management in this series.

40. EVALUATION OF ANASTOMOTIC TECHNIQUES FOR LAPAROSCOPIC RESECTION OF ISOLATED SMALL INTESTINAL PATHOLOGY

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Background: The purpose of this study was to compare perioperative outcomes for intracorporeal vs. extracorporeal anastomotic techniques for isolated laparoscopic small intestine resection.

Methods: The medical records of all patients >18 years undergoing laparoscopic segmental small intestine resection from 6/97-4/09 were reviewed. Patients undergoing laparoscopic ileocelectomy were excluded. Data are given as mean ± SD. Statistical significance (p<0.05) was determined using two-tailed t-test and Fisher's exact test.

Results: Laparoscopic resection for isolated small bowel pathology was performed in 52 patients (M:F, 30:22) with the mean age of 47 years ± 21. The most common presentation was GI bleed/anemia (n=17), SBO (n=17), and/or abdominal pain (n=9). A laparoscopic intracorporeal anastomosis was performed in 30 patients (58%), and an extracorporeal anastomosis was performed in 22 patients (42%). The operative time was greater in the intracorporeal anastomosis group (115.4 min ± 49 vs. 89.7 min ± 33, P=0.04). Otherwise, there was no significant difference (p>0.05) in mean EBL (53.7cc ± 10.24 vs. 39.1 ± 7.42), perioperative complication rate (6 vs. 4) or LOS (5.1 days ± 0.61 vs. 5.23 ± 0.76) between the two groups. Final pathology was meckel's diverticulum (9), GI stromal tumor (8), unknown (5), small bowel diverticulum (4), post-transplant lymphoproliferative disorder (PTLD)/lymphoma (4), Carcinoid (4), Adenocarcinoma (3), melanoma (2), sarcoma (2), stricture/ulceration (2), neurofibroma, schwannoma, hemangioma, metastatic small cell lung carcinoma, AVM, fibroid polyp, enteritis, lymphangioma, and serositis. Five patients experienced a grade II or greater complication, including an anastomotic leak requiring exploratory laparotomy, and two postoperative bleeds, one of which required reoperation. There was one death due to respiratory failure.

Conclusion: Laparoscopic segmental small bowel resection utilizing either intracorporeal or extracorporeal anastomotic techniques is an effective strategy for tumors and pathology isolated to the small bowel, although there is an increase in the operative time with intracorporeal anastomosis.

41. ELEVATED TNF LEVELS IN SERUM FROM DIALYSIS PATIENTS USING ARTERIOVENOUS GRAFTS OR CATHETERS COMPARED TO ARTERIOVENOUS FISTULAS FOR VASCULAR ACCESS.

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ELEVATED TNF LEVELS IN SERUM FROM DIALYSIS PATIENTS USING ARTERIOVENOUS GRAFTS OR CATHETERS COMPARED TO ARTERIOVENOUS FISTULAS FOR VASCULAR ACCESS.

Introduction: Approximately 400,000 individuals in the USA require hemodialysis for renal failure. The National Kidney Foundation's Kidney Disease Outcomes Quality Initiative Guidelines and the Medicare sponsored Fistula First Breakthrough Initiative recommend the use of an autogenous arteriovenous fistula (AVF) as the preferred method for permanent vascular access. Compared to arteriovenous grafts or catheters, patients with AVFs have improved survival rates, dramatically lower morbidity risks, fewer interventions, and lower health care costs. AVF rates are improving in the United States, yet 50% of patients still have grafts or catheters as permanent access. Multiple proinflammatory cytokines are associated with infections and/or chronic inflammation and may prove to be useful markers for monitoring these events and predicting clinical outcomes in dialysis patients with different of Methods of vascular access. The aim of this study was to determine whether proinflammatory cytokine serum levels differ in dialysis patients with grafts, catheters or arteriovenous fistulas.

Methods: Human blood was collected during routine dialysis access at the St. John Outpatient Xanthus Dialysis Center following patient consent using an OUHSC IRB-approved protocol. Serum was stored at -80°C until testing. Levels of the inflammatory cytokines IL-8, IL-1b, IL-6, IL-10, and TNF and IL-12p70 were measured using a Becton Dickinson (BD) Cytometric Bead Array - Human Inflammatory Cytokine Kit. Samples were analyzed using a BD FACSCalibur flow cytometer and CellQuest-Pro software. Cytokine levels from 39 patients (12 graft, 15 AVF, and 12 catheter) were compared using Tukey-Kramer Multiple-Comparison Tests.

Results: We found a statistically significant increase in levels of TNF in serum from both graft and catheter patients compared to AVF patients ($p=0.003293$). A multiple comparison analysis also showed a statistically significant difference ($p=0.034853$) in IL-12p70 levels, however, the patient sample size was not large enough to definitively determine whether the levels of TNF in serum from AVF patients was different from the levels in the other two groups. We did not find statistically significant differences for the other cytokines tested.

Conclusion: The higher level of TNF found in the graft and catheter patients is indicative of elevated inflammation in patients with these types of vascular access compared to those with fistulas. TNF is a cytokine released early during inflammatory

responses which impacts multiple types of immune cells and other downstream inflammatory mediators. Further study is warranted with a larger cohort to determine whether serum levels of TNF correlate with other inflammatory factors or clinical outcomes in patients undergoing dialysis treatment.

42. IF THE STRATEGIES FAIL - LAPAROSCOPY ADHESIOLYSIS

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Introduction: Adhesions formation is one of the most common encountered problems after abdominal surgery. Laparoscopic treatment reports started in 1991. During the first years laparoscopy was performed, it was practically banned for the treatment of adhesions because of the high risk of bowel perforation. As time progressed, it has become more accepted, and good Results are being seen when a diagnostic laparoscopy is performed in cases where intestinal obstruction is the diagnosis.

Methods: We analyzed the data of 402 patients with a diagnosis of intestinal obstruction which a diagnostic laparoscopy was performed. The study included 185 male patients and 217 female patients with a mean age of 61 years. Small bowel obstruction was encountered in 279 patients and 123 colon obstruction were observed.

Results: A conversion rate of 3.3% was seen. The most common intraoperative complication was an adverted enterotomy in 3.5% of patients. The postoperative complications were ileus in 4.8% of patients with a 2.9% rate of septic patients.

Conclusion: The treatment of intestinal obstruction with a laparoscopic approach is safe and feasible. When a totally laparoscopic approach is not possible, a diagnostic laparoscopy helps in determining the site and possible causation of obstruction.

43. THE ASSOCIATION BETWEEN INTESTINAL INFECTIONS AND THE HUMAN VERMIFORM APPENDIX

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Background: The function of the human vermiform appendix has long been a matter of debate. Although there is no confirmatory data, one recent theory suggests that the appendix functions as a “safe house” for commensal bacteria, while excluding pathogens. As such, in the event of pathogen exposure and purging of intestinal tract contents, the appendix provides support for normal gut flora growth and re-inoculation of the colon. Here, we seek to assess the correlation between *Clostridium difficile* intestinal infections and appendectomy. We hypothesize that the rate of prior appendectomy will be higher among patients with a positive test for *C. difficile* as compared with the rate of prior appendectomy among those with a negative test.

Methods: This was a retrospective, case-controlled study. Patients over the age of 18 who were tested for *Clostridium difficile* at a major, urban, university hospital between 11/2007 and 12/2008 were included. Cases were defined as testing positive on the first in-patient Cytotoxin assay or Toxin A & B EIA tests. Patients were either mailed a questionnaire or phoned to determine whether they had undergone prior appendectomy.

Results: Our study enrolled 222 patients ranging in age from 18 to 99 (median = 61, interquartile range: 50 to 74), and included 110 males and 112 females. Among 102 patients that tested positive for *C. difficile*, we found 22 (21.6%) had prior appendectomies. Among 120 patients testing negative for *C. difficile*, we found 37 (30.8%) had a prior appendectomy (difference in proportions = -9.3%; 95% Confidence Interval: -18.4% to +0.5%).

Conclusion: The rate of prior appendectomy was actually lower among patients with a positive test for *C. difficile*, as opposed to the rate among patients with a negative test.

45. SETTING THE BAR FOR LAPAROSCOPIC RESECTION OF SPORADIC INSULINOMA

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Background: Laparoscopic insulinoma resection (LIR) for sporadic disease is increasingly being reported as a feasible and safe operation in small series of patients. The laparoscopic management of insulinoma appears to be ideal because insulinomas are typically benign, solitary, and patients are often cured with an enucleation procedure. To determine if LIR is an acceptable alternative to the standard open operation, it is necessary to compare LIR to historical controls. The purpose of this study was to establish outcome standards for LIR and to identify the skills set and technology needed for a successful operation.

Methods: A prospective database of patients with benign sporadic insulinoma was reviewed for demographics, imaging, operative/pathology reports and outcomes. A meta-analysis of the English literature was performed to identify patients who underwent a total LIR. The outcomes of the historical control group were compared to the LIR group.

Results: 219 patients (126 women, 93 men) underwent a primary operation for benign sporadic insulinoma between the years 1982-2008. A meta-analysis identified 230 patients who underwent LIR between the years 1996-2009. Imaging for localization in the control group included abdominal US (90%), CT (52%), EUS (9%) and IOUS (81%) with sensitivities of 64%, 59%, 83% and 98%. In the LIR group CT/MRI was performed in 95%, EUS in 45%, and LapUS in 66%. The control group was treated by enucleation (69%), distal pancreatectomy (28%) and pancreatico-duodenectomy (2%). There were 2 patients that had negative explorations. The LIR group patients underwent either enucleation (64%) or distal pancreatectomy (35%). There were solitary tumors in 212 (96%) control patients. The tumor was protruding in 8%, visible in 17%, palpable in 61% and intrapancreatic in 14%. One LIR patient had two tumors. Both groups had a mean tumor size 1.6cm. Tumors in the control group were located in the head-28%, uncinate-11%, neck-8%, body-27% and tail-26%. The pancreatic duct (PD) was adjacent (< 5mm) to the tumor in 31%, distant in 32% and unspecified in 37%. IOUS aided the operation in 156/178 (anatomy 65%, localize 14%, confirm 9%). Those undergoing LIR had tumors located in the head-10%, neck-9%, body-42% and tail-38%. The relationship of the tumor to the pancreatic duct was rarely documented in the LIR group. The mean EBLs, operating times, and LOS were comparable between the control group and the LIR group (212 ml vs 185 ml, 202 min vs 192 min, 9 days for both; p=NS). Pancreatic complications occurred more often in the LIR group (25% vs 15%, p< 0.05). A curative operation was performed in 98% of control and in 99.5% of the LIR group.

Conclusion: Palpation with IOUS has been critical for curative insulinoma resection with modest morbidity. Multiple tumors are rare and a focused resection guided by

imaging can be performed. LIR is associated with an increased incidence of pancreatic complications. Success of LIR will depend on accurate multimodality preoperative imaging, skilled use of lap-US to replace palpation for localization and safe Methods to dissect the tumor adjacent to the PD.

46. PRIMARY LARGE THYMIC TUMORS: SURGICAL TREATMENT AND OUTCOMES

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Background: Thymic tumors are rare. Large thymic tumors are difficult to manage. Our aim was to assess the treatment and outcomes of patients who underwent thymectomy for primary large thymic tumors.

Methods: Retrospective chart review of patients who underwent thymectomy in our center from 2007-2009. The values are reported in median and Interquartile range (IQR).

Results: There were 9 patients (4 males and 5 females), with median age of 64 years (IQR 48-66). The median of the largest dimension of the tumor was 12 cm (IQR 10-13.2). Neoadjuvant chemoradiation therapy was given to 5 patients with minimal response. There was one patient with Masaoka clinical stage I, two stage IIa, three stage III, two stage IVa and one stage IVb. All were treated with surgical resection. Five had median sternotomy, 3 had posterolateral thoracotomy (one required intrapericardial pneumonectomy due to involvement of left pulmonary artery) and one had combined sternotomy and thoracotomy (for involvement of lung, pericardium and hemidiaphragm). Adjuvant therapy was given to three patients. Involvement of great vessels on imaging was seen in six patients and all were resected without need for vascular reconstruction. In 2 patients “debulking” was performed with minimal residual tumor, and both patients received post operative chemoradiation. There were no intraoperative deaths. All patients are alive at a median follow-up of 13 months (IQR 4-21).

Conclusion: Locally advanced thymomas can be safely resected. Involvement of great vessels on imaging does not preclude resection and the majority are completely resected. Aggressive “debulking” should be considered for involvement of vital structures, to be followed by adjuvant therapy for the residual disease.

48. OSTOMY REVERSAL FOLLOWING DAMAGE CONTROL LAPAROTOMY: ONE INSTITUTION'S EXPERIENCE

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Background: Recent reports cite an increased risk of anastomotic complications when delayed reanastomosis is undertaken for patients left in colonic discontinuity after damage control laparotomy (DCL) and recommend ostomy creation. For this pathway to be beneficial, morbidity and mortality from ostomy reversal must be acceptable. The aim of this study was to evaluate our experience with stomal reversal in patients having undergone prior DCL / colon resection / ostomy creation (DCL/CR/OC).

Methods: A retrospective review was performed of patients having undergone DCL/CR/OC and subsequent reversal from 1/2004 -4/2009. Charts were analyzed for patient demographics, method of initial abdominal closure, complications (intra-operative, wound, and intra-abdominal), as well as mortality following stomal reversal.

Results: 18 patients met inclusion criteria (general surgical emergencies, 39%; trauma, 61%). Method of abdominal closure during the first hospitalization included primary fascial closure (PFC; n=10), fascial closure utilizing bridging acellular dermal matrix (ADM; n=3) and skin grafting upon a granulating tissue bed (STSG; n=5). Overall, seventeen complications occurred in 10 patients (56%) with no mortality. Complications included enterotomy, intra-abdominal abscess, enterocutaneous fistula, anastomotic dehiscence, ileus, and hernia. Specific wound complications included infection, bleeding, and dehiscence. The STSG group had 6 complications in 4 patients (80%). Six complications occurred in 2 patients of the ADM group (67%). Finally, the PFC group had 5 complications in 4 patients (40%). In this last group, the complications were limited to the wound site, as opposed to intra-abdominal issues. Despite a trend towards increased complications, there were no statistically significant differences in complication rates if PFC was not achieved.

Conclusion: Ostomy reversal in patients with DCL/CR/OC is associated with significant morbidity but not mortality. Complication risk may be increased if PFC cannot be obtained during the initial hospitalization.

49. VENOUS THROMBOEMBOLISM IN PATIENTS WITH TRAUMATIC BRAIN INJURY

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Background: Optimal thromboprophylaxis in patients with traumatic brain injury (TBI) remains controversial largely because of continued uncertainty regarding the risks versus benefits in this difficult patient population. The use of low dose anticoagulation has potentially devastating consequences in patients with TBI and must be balanced against the risk and consequences of developing venous thromboembolism (VTE). The purpose of this study was to characterize the incidence and outcome of venous thromboembolism in patients with TBI as well as its relationship to thromboprophylaxis.

Methods: Over a one and a half year period, patients admitted to our Level I trauma center with blunt TBI were identified. Data regarding patient demographics, admission Glasgow Coma Score (GCS), injury severity and description, use of thromboprophylaxis, occurrence of VTE, and outcome were tabulated. DVT was diagnosed based on duplex ultrasonography screening performed weekly and for symptoms. Pulmonary embolism (PE) was diagnosed using CT angiography and V/Q scanning based on the clinical situation.

Results: A total of 340 trauma patients with TBI were identified. Mean patient age was 51 ± 21 years and 32.7% were female. The median ISS was 18.5 and the median maximum head Abbreviated Injury Scale (AIS) was 4. There were 106 patients with multiple trauma (31.2%). Mechanical thromboprophylaxis was used in 87% of patients and pharmacologic thromboprophylaxis was used in 65% of patients. There were 18 VTE's, including 4 PE's (1.18%), 15 DVT's (4.41%) with one patient who developed both a PE and a DVT. The incidence rate was 3.77 DVT's per 1,000 patient days and 1.00 PE per 1,000 patient days. Patients with VTE were more likely to have a head AIS = 5 (50% vs 20%, $p=.01$), to be multiply-injured (56% vs. 30%, $p=.02$) and to have a longer length of stay (18.5 vs. 7 days, $p < .001$). There were no deaths in patients who developed a VTE. The use of mechanical and pharmacologic thromboprophylaxis did not significantly affect the development of VTE.

Conclusion: The incidence of VTE in patients with TBI was small and was not significantly affected by thromboprophylaxis. More study is needed to determine high risk subgroups of patients with TBI in whom aggressive use of thromboprophylaxis may be warranted.

50. COAGULATION CONTROL AND FINANCIAL PRUDENCE; MASSIVE TRANSFUSION PROTOCOL COMPLIANCE IN TRAUMA

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Background: The utilization of Massive Transfusion Protocols (MTP) for trauma patients presenting with near-exsanguinating injuries has become popular. However, evidence suggests that compliance with MTP in the OR may not always occur. Therefore, the purpose of this study was to assess coagulopathy control and protocol compliance after initiation of an MTP at an ACS-verified Level I Trauma Center.

Methods: During a 10-month period (10/07 - 6/08), 227 Category I patients (ACS-COT guidelines) occurred from 1,913 trauma alerts. Of these, 18 operative trauma patients were identified by blood bank and/or trauma registry with documentation of MTP or utilization of >10 U PRBCs in 24hrs. Primary outcomes were mortality and control of coagulopathy (INR <1.4 and APTT $< 1.5x$ control) within 8 hours of the post-operative period. The secondary outcome was MTP compliance in the OR. Actual OR blood product costs were compared to projected blood product costs if MTP were utilized ($n = 18$). Means \pm SDs are reported, and the paired t-test is used to compare actual vs. projected costs. Statistical significance was determined at $p < 0.05$.

Results: Of the 18 trauma patients, 56% were male with a mean age of 41.5 ± 20.0 years. The mean ISS was 22.5 ± 8.9 and 72% of patients had blunt injuries. Survival was 67% (12 of 18 patients) at 8 hours post-operatively. Compliance with MTP for blood and blood product resuscitation in the OR was 39% (7 of 18 patients). Three of the seven MTP patients were coagulopathic on admission, and one patient who remained coagulopathic at 8 hours post-op died. The remaining two patients were not coagulopathic at 8 hours and survived. Four of the seven MTP patients were not coagulopathic on admission. Two patients became coagulopathic at 8 hours and survived. A third patient was non-coagulopathic at 8 hours and died, and the fourth patient had an unknown coagulation status at 8 hours post-op and survived. Eleven patients belonged to the non-MTP group and received "a la carte" ordering of blood and blood products while in the OR. Four of the eleven patients were coagulopathic on admission. Three had no coagulopathy at 8 hours and survived. One remained coagulopathic at 8 hours and died. Another three patients were not coagulopathic on admission, but coagulopathic at 8 hours and only one patient survived. Admission coagulopathy status was unknown on four of the non-MTP patients, of which 2 patients had an unknown coagulopathy status at 8 hours post-op and one patient died. The other 2 patients with unknown coagulopathy status on admission were not coagulopathic at 8 hours and survived. Mean difference between actual blood and blood product costs and projected costs (assuming MTP compliance in the OR) at 8 hours was \$1,124 ($p < .001$).

Conclusion: Coagulopathy on admission and at eight hours post-operatively was highly associated with mortality. During operative trauma, the lack of MTP compliance may have contributed to uncorrected coagulopathy and higher actual blood product costs.

51. OCULAR TRAUMA: AN EPIDEMIOLOGIC REVIEW FROM A LEVEL ONE TRAUMA CENTER

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Background: Ocular trauma is the most common ophthalmic reason for hospitalization. To best serve the needs of the injured patient, The American College of Surgeons (ACS) Committee on Trauma (COT) requires that a full spectrum of surgical sub-specialists, including ophthalmology, be available at a level one center. However, the epidemiology of ocular trauma is not well described. The purpose of this study was to determine the incidence of ocular trauma as well as to describe patient characteristics, injury characteristics and outcomes at a level one trauma center.

Methods: We performed a retrospective review of all patients sustaining eye injury at our urban level one trauma center over an 18 month period (January 2008-July 2009). Data extracted from the trauma registry and medical record included age, gender, type of ocular injury (external injury, anterior chamber injury, posterior chamber injury, or combination), mechanism of injury, presence of associated injuries, need for operative intervention for ocular injury, and outcome (vision loss).

Results: Over the study period 7,652 trauma patients were evaluated at our level one center. There were 108 patients (1.4%) with 157 ocular injuries. 74.5% of patients were male. Mean age was 33.8 years. The majority of patients had blunt mechanism of injury (77.9%) including assault (28.2%), motor vehicle collision (19.4%), fall (10.7%), motorcycle collision (6.8%), and other blunt (12.8%). The remainder suffered a penetrating injury (22.1%) including gunshot wound, stab wound and other foreign body. 55 patients (51%) had an external eye injury (sclera, conjunctiva, and/or lacrimal duct). 54 patients (50%) had an injury to the anterior chamber (cornea and/or lens). 22 patients (20%) sustained an injury to the posterior chamber (vitreous, retina, and/or choroid). 49 patients (45%) had combined injuries (more than one area) and 19 patients (17.5%) had bilateral injuries. Head injuries were the most common associated injury (62.9%) followed by chest injuries (17.5%), extremity injuries (11.1%) and neck injuries (4.6%). 36 patients (35%) required operative management, 9 of whom underwent enucleation. 25 (23.4%) patients were characterized as having significant vision loss at hospital discharge.

Conclusion: Ocular trauma is uncommon on presentation to a level one center after injury. The most common mechanism resulting in ocular injury is assault and patients are more commonly male. Most patients that suffer ocular injury sustain an injury to more than one part of the eye, and a significant portion require operative intervention. Unfortunately up to 25% of patients have poor visual outcomes; therefore, ophthalmologic surgeons remain an important part of trauma care due to the highly specialized nature of surgery to the eye.

52. DRAMATIC INCREASES IN MOTORCYCLE CRASH INJURIES: A NINE YEAR REVIEW

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Background: Motorcycle (MCC) crashes are a significant cause of injuries and deaths. We hypothesized that motorcycle crash related injuries have recently increased in number and severity and that these increases are likely related to an increase in motorcycle riding related to higher fuel costs.

Methods: All motorcycle crash and motor vehicle crash (MVC) related injuries and deaths were reviewed from 2001-2009 using a single trauma center's trauma registry (2009 totals annualized from YTD through Sept). To control for population and referral bias, motor vehicle crash rates were used as a control for motor cycle crashes (MCC/MVC ratio). Mean state weekly regular gasoline prices were obtained from the Department of Energy and averaged for each year.

Results: There were 1,448 motorcycle crash patients (pts) and 9,785 motor vehicle crash pts over the nine year study period. Respective MCC, MVC and MCC/MVC ratio and gasoline price by year are as follows: 2001-82, 748, 0.11, \$1.32; 2002-98, 1191, 0.08, \$1.27; 2003-107, 1079, 0.09, \$1.44; 2004-128, 1079, 0.12, \$1.73; 2005-152, 1131, 0.13, \$2.17; 2006-175, 1202, 0.15, \$2.46; 2007-205, 1186, 0.17, \$2.68; 2008-269, 1065, 0.25, \$3.13; 2009-232, 1028, 0.23, \$2.15. From 2001 to 2009 motor vehicle crashes increased by 37%, while motorcycle crashes increased by 283% ($p < 0.01$). MCC/MVC ratio doubled over the study period ($p < 0.01$). Fuel price and MCC admissions were strongly correlated ($R^2 = 0.83$, $p < 0.01$), and when using MVC as a reference control (MCC/MVC ratio) the correlation was even greater ($R^2 = 0.93$, $p < 0.01$). Motorcycle crash patients with an injury severity score > 15 increased out of proportion to the overall increase in motorcycle crash related trauma: 2001-24, 2002-32, 2003-37, 2004-42, 2005-46, 2006-57, 2007-72, 2008-110, 2009-112.

Conclusion: Over the past nine years, motorcycle crash related injuries have dramatically increased out of proportion to motor vehicle crash related injuries. This is strongly correlated with retail gasoline prices. Regardless of cause, there has been a largely unrecognized epidemic of motorcycle crash injuries over the study period.

53. COMPLIANCE OF MECHANICAL THROMBOPROPHYLAXIS FOR DEEP VENOUS THROMBOSIS (DVT) IN TRAUMA PATIENTS

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Background: The American College of Chest Physicians DVT prophylaxis guidelines recommend intermittent pneumatic compression device (IPC) use in trauma patients who have contraindications for anticoagulation. These guidelines do not elaborate on the acceptable amount of time these devices need to be in place in order to have the prophylactic effect. Several studies have reported IPC compliance rates of 48-59%. However, studies reporting on the prophylactic benefit of IPCs demonstrate that a compliance of 75-80% is needed. Previous studies relied on intermittent patient observation or bedside nurse charting for compliance rates. Both these Methods may not reflect the true compliance rates. Currently, there is an IPC device, the Continuous Enhanced-Circulation Therapy (CECT, ActiveCare+SFT) device that internally records compliance. This study was undertaken to determine compliance rates on the use of this CECT device and to determine factors hindering its use.

Methods: This was a prospective analysis of trauma patients hospitalized at one Level II Trauma Center who had mechanical thromboprophylaxis using the CECT device that internally records the time each device is applied and functioning. Nurse and ancillary staff were educated on the use of the CECT. Nursing protocol allowed for the device to be off for 30-60 minutes each 12 hour shift. One dedicated Advanced Practice Nurse followed each patient daily and made observations of use and nonuse.

Results: There were a total of 51 patients who had the CECT device placed for a mean of 7.3 days. Mean compliance rate was 75.4%. 22 patients had 80% or greater compliance, 7 patients had 75-79% compliance, and 22 patients had less than 75% compliance. Observations of noncompliance was noted when patients were moved off the unit or floor (i.e. transfer to Radiology, Operating Room or another unit), up out of bed, or undergoing physical therapy.

Conclusion: Our compliance rate reached the level of thromboprophylaxis benefit of 75%. However, 43% of our patients had a compliance rate lower than optimal. There appears to be a disconnect between what is ordered by the physician and what is done on the patient with regards to placement of functioning CECT devices for DVT prophylaxis. More aggressive educational measures are warranted with nursing and all support staff to improve compliance rates.

56. THE EFFECT OF DIABETES ON CLINICAL AND UTILIZATION OUTCOMES FOR PATIENTS UNDERGOING LAPAROSCOPIC CHOLECYSTECTOMY

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Background: Laparoscopic cholecystectomy for gallbladder disease is one of the most common surgical procedures performed in hospitals throughout the world. The effect of diabetes on clinical and utilization outcomes for patients undergoing laparoscopic cholecystectomy is not fully understood. This study evaluates these outcomes for diabetic and non-diabetic patients undergoing elective and emergency laparoscopic cholecystectomy.

Method: We analyzed demographic, clinical, and utilization data in diabetic and non-diabetic patients undergoing laparoscopic cholecystectomy in a five-hospital community health system from 1 December 2008 to 31 January 2009. Statistical analysis was by Kruskal-Wallis test, Fisher's exact test, Analysis of Variance, and Pearson's Chi-Square test.

Results: 319 patients met inclusion criteria for analysis of which 76 (23.8%) were patients with diabetes and 243 (76.2%) were patients without diabetes. Demographically, patients with diabetes had increased mean age (60 v. 47 years, $p < 0.001$), higher male predominance (51% v. 28% men, $p < 0.001$), and higher prevalence of comorbid conditions (hypertension, dialysis-dependant renal failure, and hyperlipidemia, $p < 0.001$ for each) compared to patients without diabetes; there was no difference in BMI, previous abdominal surgery, or tobacco and/or alcohol use. Clinically, patients with diabetes had a higher mean presenting white blood cell count (11.8 v. 10.1 $k/\mu L$, $p = 0.03$), median presenting total bilirubin (1 v. 0.8 mg/dL, $p < 0.001$) and incidence of biliary pancreatitis (13.2% v. 4.6%, $p = 0.015$) compared to patients without diabetes; there was no difference in time to presentation, symptoms of biliary colic and/or nausea or vomiting, hepatic transaminases, or mean temperature on admission. There was no statistical difference in mortality (0% v. 1.2%, $p = 1$) or complications (1.3% v. 2.9%, $p = 0.685$) between patients with and without diabetes. In terms of utilization, patients with diabetes had no difference in mean operative time (51 v. 45 minutes, $p = 0.071$), increased median time from admission to start of operation (1.5 v. 0.4 days, $p < 0.001$), and increased median postoperative length of stay (1.5 v. 0.9 days, $p < 0.001$) when compared to patients without diabetes.

Conclusion: For patients undergoing laparoscopic cholecystectomy:

1. Patients with diabetes present at the same time from onset of symptoms and with similar symptoms as patients without diabetes, but are more likely to be men, older, and have more comorbid conditions. Also, there is a higher incidence of biliary pancreatitis in patients with diabetes.
2. There is no difference in mortality or complications from laparoscopic cholecystectomy between patients with diabetes and those without diabetes.
3. Patients with diabetes have no difference in operative time but have a longer time from

admission to start of operation and postoperative length of stay compared to patients without diabetes.

57. THE IMPACT OF ABDOMINAL CLOSURE ON PATIENTS WITH NON-TRAUMA INTRA-ABDOMINAL CATASTROPHES

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Introduction: Little evidence exists regarding the impact of abdominal closure techniques in patients with intra-abdominal catastrophes. Our objective was to compare outcomes of initial fascial closure (IFC) to temporary abdominal closure (TAC).

Methods: Retrospective review from 1998 to 2008 identified cases of emergency laparotomy with TAC and a control group consisting of year-matched patients who underwent emergency abdominal surgeries with IFC. Demographics, comorbidities, surgical techniques, morbidity, disposition, and mortality were analyzed using two-tailed t-tests, ANOVA, and Fisher's Exact Test.

Results: 210 patients were identified in the following groups: TAC (n=81,39%) and IFC (n=129,61%). Mean age was 63+/-1 for TAC and 64+/-1 for IFC (p=NS). Mean APACHE IV score was 74+/-2 for TAC and 64+/-3 for IFC (p=0.003). 25 (19%) IFC patients were taken back (TB) to the operating room for failure of their initial closure, and 28% of those required TAC. There were no differences in ICU and overall lengths of stay, ventilator days, tracheostomy, nosocomial infections, and mortality in TB versus TAC. 59% in TAC group and 76% in TB group required time in a long-term acute care facility (p=0.19).

Conclusion: After surgery for intra-abdominal catastrophes, patients with successful IFC fare better than those with TAC. Notably, failure of IFC leads to outcomes equivalent to TAC. These findings suggest that intraoperative decisions regarding initial fascial management should not be unduly influenced by fear of treatment failure.

58. CHANGING TRENDS IN THE MANAGEMENT OF ACUTE COLONIC DIVERTICULITIS: A SINGLE CENTER PERSPECTIVE

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Background: Acute diverticulitis of the colon remains a common problem with potentially catastrophic consequences. Improvements in abdominal imaging Methods and interventional radiological techniques have occurred over the past several decades. To determine how these changes have affected the natural history of the disease, we compared our recent experience with an earlier data set from our center.

Methods: A retrospective review was conducted at a university hospital using ICD 9 and CPT codes to identify patients who presented between 1/06-12/08 with acute diverticulitis. Ethnicity was based on family surname. Data was then compared to that reported from the same institution between 1982-1989.

Results: In the previous study, 26% of patients were ≤ 40 years old, while the current study shows that number has increased to 34% ($p=0.061$). Hispanic patients made up 71% of the population previously and currently account for 79% ($p=0.039$). Interventional radiology was involved with 6% of patients in the current study and 0% in the previous study ($p<0.001$). Operative intervention was undertaken in 37% of patients in the previous study and 28% in the current study ($p=0.036$). When broken down by age groups, patients ≤ 40 years of age underwent operative intervention significantly less frequently in the current study at 25% versus 48% in the previous study ($p=0.006$). The same was true for urgent operative intervention in the ≤ 40 age group at 34% in the previous study and only 10% in the current study ($p<0.001$). Multistage operations are now less common with 56% of patients previously undergoing multistage operations compared to only 24% in the current study ($p<0.001$). This was true for both age groups (≤ 40 years 48% vs 20%, $p=0.031$, >40 60% vs 26%, $p<0.001$). Mortality was significantly less in the current study at 0% versus 3% in the previous study ($p=0.03$).

Conclusion: Significant differences in the management of patients with acute diverticulitis have emerged over the last two decades, presumably as a result of changing trends in diagnostic and interventional radiological techniques. It appears that acute colonic diverticulitis is becoming more prevalent in younger patients. In addition, young patients with acute diverticulitis are undergoing both elective and urgent operations less frequently, while significantly fewer multistage operations are being performed. This may account for the significant decrease in mortality noted over this time period. In summary:

1. A greater percentage of patients are now managed non-operatively
2. Those who require operative management are more likely to have single stage procedures

Given this knowledge, clinicians should have a higher index of suspicion for the diagnosis

of acute diverticulitis in younger patients, single staged procedures should be attempted when possible, and non-operative Methods should be considered whenever clinically appropriate.

59. QUESTIONABLE CHOLECYSTITIS: PET-CT ANSWERS THE QUESTION

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Background: Cholecystitis is commonly diagnosed with ultrasound. When indeterminate, HIDA has been used, but has a high false positive rate. Inflamed tissue metabolizes glucose at a high rate. Fluorodeoxyglucose (FDG) is a glucose analogue, which emits radioactivity that can be detected by PET and localized by CT. The purpose of this study is to evaluate the ability of 18FDG PET-CT to accurately diagnose cholecystitis.

Method: 20 patients with suspected cholecystitis based on history, physical exam, laboratory values, abdominal ultrasound (US), and HIDA scan were studied (group S). After obtaining consent, patients were injected with 18FDG, and 30-90 minutes later underwent PET-CT. This was done within 48 hours of admission but prior to the patients undergoing operation. We measured correlation between PET-CT Results and pathology findings or clinical course. Patients in group S were compared with 40 consecutive control subjects who underwent 18FDG PET/CT for reasons other than cholecystitis (group C).

Results: Of the 20 patients in S, 10 were positive for cholecystitis on PET-CT. Nine of these 10 underwent cholecystectomy and pathology confirmed acute cholecystitis, and one was managed nonoperatively due to multiple co-morbidities. Of the remaining 10 patients in S with negative PET-CT, 9 were successfully managed non-operatively, and one underwent cholecystectomy but pathology showed no evidence of cholecystitis. All 40 controls had negative PET in the gallbladder region.

	Group S, suspected cholecystitis		
	+HIDA (+Path)	-HIDA (+Path)	No HIDA (+Path)
+PET (n=10)	5 (4)	1 (1)	4 (4)
-PET (n=10)	6 (0)	2 (0)	2 (0)

Conclusion: 18FDG-PET/CT successfully detected gallbladder inflammation in all patients with pathology proven cholecystitis. It appears to be more accurate than HIDA in diagnosing cholecystitis.

60. ACUTE RENAL FAILURE AS AN INDEPENDENT RISK FACTOR FOR MORBIDITY AND MORTALITY FOLLOWING COLORECTAL SURGERY

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Background: Renal failure has been established as a significant risk factor in several surgical procedures. However, acute renal failure (ARF) has yet to be defined as an independent risk factor for inpatient morbidity and mortality following colorectal surgery.

Methods: We performed a retrospective analysis using the Healthcare Cost and Utilization Project Nationwide Inpatient Sample from 2002 to 2007, identifying patients who underwent laparoscopic or open colectomy. Patients who developed acute renal failure following colorectal surgery were identified, and the association between this complication and other morbidity and mortality was analyzed, with and without adjustment of pre-morbid conditions. Risk adjustment data was performed using Elixhauser risk adjustment.

Results: Between 2002 and 2007, 323,490 patients underwent laparoscopic or open colectomy (laparoscopic 5.3%, open 94.7%). Of these patients, 14,185 (4.4%) developed acute renal failure during their hospital stay. Unadjusted inpatient mortality was dramatically higher in those who developed acute renal failure (31% vs. 3.8%). After risk adjustment, the odds ratio for mortality from developing ARF is 8.2 (95% CI: 7.7-8.8). Length of stay, venous thromboembolism, ileus, obstruction, dehiscence, anastomotic leak, respiratory failure, and abscess all have a statistical significantly higher occurrence rate in patients who develop acute renal failure (p<0.0001 for all).

Conclusion: Acute renal failure is associated with an increase in morbidity and mortality following colorectal surgery, even after adjustment for co-morbid conditions. Because of the dire consequences of acute renal failure, additional attention should be focused on its prevention, early recognition, and treatment.

61. TRANS-UMBILICAL SINGLE INCISION LAPAROSCOPIC CHOLECYSTECTOMY

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Background: Laparoscopic cholecystectomy has traditionally been performed using multiple small incision port sites. Single incision, or single site, laparoscopic surgery has emerged as an alternative technique to improve cosmesis and minimize complications associated with multiple incisions.

Methods: A retrospective study was performed of all patients who underwent laparoscopic cholecystectomy by a single surgeon from April 2008 to July 2009. Charts were reviewed for surgical indication, operative technique (multiple vs. single trans-umbilical incision), operative time, length of stay, and surgical complications. A comparison of multiple incisions versus single incision outcomes were evaluated. Results: Forty-five patients underwent the traditional laparoscopic approach using 4 port incisions while thirty-seven patients underwent a single incision trans-umbilical approach. Average age and sex were comparable between the two groups. Indications for surgery included cholelithiasis (76%), cholecystitis (16%), biliary dyskinesia (6%), and porcelain gallbladder (2%).

Operative time was slightly longer for those undergoing single incision (65 minutes; range 35-125) versus 4-port incision (47 minutes; range 24-80), however, average length of stay was comparable between the two groups (1.3 days vs. 1.2 days). One patient who underwent multi-incision cholecystectomy was readmitted for biliary pancreatitis. There were no reported complications or readmissions for all patients who underwent single incision surgery.

Conclusion: Single incision trans-umbilical laparoscopic cholecystectomy can be an effective alternative to multi-incision cholecystectomy, with the added benefit of minimizing scarring. This technique can be performed safely for patients with a multitude of gallbladder disease without resulting in additional complications. A longer operative time may be needed initially to adjust for learning a new operative technique.

62. RIGHT UPPER QUADRANT PAIN DOES NOT DISTINGUISH BETWEEN ACUTE AND CHRONIC CHOLECYSTITIS

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Background: Cholelithiasis is present in 10-20% of adults, and over 600,000 patients undergo laparoscopic cholecystectomy annually. Historically, the presence or absence of right upper quadrant (RUQ) pain, clinical Murphy's sign and sonographic Murphy's sign have aided in the diagnosis of acute versus chronic cholecystitis. Present data indicates that these clinical findings may not be accurate in delineating between the two diagnoses.

Methods: Patients with acute or chronic cholecystitis (symptomatic cholelithiasis) who presented for laparoscopic cholecystectomy were prospectively enrolled in the study. Demographic, clinical, radiographic, operative and postoperative data was collected. Presence or absence of RUQ pain, clinical Murphy's sign, sonographic Murphy's sign, radiographic diagnosis, intraoperative diagnosis and pathological diagnosis were evaluated in their ability to discriminate between acute and chronic cholecystitis using Cohen's kappa coefficient with correction for multiple variables.

Results: A total of 104 patients were enrolled in this study. Acute cholecystitis was diagnosed intraoperatively in 50 patients, and 54 patients were considered to have chronic cholecystitis. There were 40 men (22 acute, 18 chronic) and 64 women (28 acute, 36 chronic) enrolled. Pathologic diagnosis showed moderate agreement with intraoperative diagnosis in 73% of patients ($\kappa=0.51, p<0.01$) and radiographic diagnosis in 81% of patients ($\kappa=0.52, p<0.01$), but showed less agreement with the other clinical tests (sonographic Murphy's $\kappa=0.31, p<0.02$; clinical Murphy's $\kappa=0.24, p<0.16$; RUQ pain $\kappa=0.15, p<0.69$). Intraoperative diagnosis showed moderate agreement with radiographic diagnosis, agreeing in 72% of patients ($\kappa=0.43, p<0.01$), but showed less agreement with clinical Murphy's sign ($\kappa=0.34, p<0.01$), sonographic Murphy's sign ($\kappa=0.29, p<0.01$), and RUQ pain ($\kappa=0.26, p=0.06$).

Conclusion: Intraoperative diagnosis, radiographic diagnosis and pathologic diagnosis agreed well in differentiating acute and chronic cholecystitis. Other commonly used diagnostic modalities including sonographic and clinical Murphy's sign and RUQ pain showed poor agreement in diagnosing acute versus chronic cholecystitis and should be used cautiously in clinical decision making.

63. EVALUATION OF RACE AND SOCIOECONOMIC STATUS AS PREDICTORS OF MORBIDITY AND USE OF LAPAROSCOPY IN ADULTS WITH APPENDICITIS

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Background: We previously demonstrated that equal healthcare access eliminated racial and socioeconomic disparities in delay of surgical care. This study determines whether such disparities exist in the management of appendicitis in a system with equal healthcare access.

Methods: A retrospective review of all patients (≥ 18 years) with appendicitis from 1998-2007 was performed. All members in this single-provider system have equal healthcare access. Socioeconomic data extracted from the US Census database. Study outcomes were morbidity and use of laparoscopy. Independent variables included race, annual median per-capita income, and parental education level. Univariate and multivariate (controlling for age, gender, perforation, race, income, and education level) analysis was performed with a $p < 0.01$ considered significant.

Results: 16196 patients were identified (mean age=41 years, 54% male). Wound infection, abscess drainage, and readmission rates were similar in all races and all education and income levels. On multivariate analysis, total morbidity was lowest in Hispanics and similar in all other races and all income and education levels. The adjusted odds ratio (aOR) for laparoscopy use was similar in all races. The aOR for laparoscopy use was higher in high income (1.21, 1.10-1.34) and medium income (1.25, 1.14-1.36) families compared to low income families. The aOR for laparoscopy use was similar in patients of all education levels.

Conclusion: Lower socioeconomic status and minority Background did not correlate with higher morbidity in the treatment of appendicitis. Race and education levels did not affect use of laparoscopy. However, patients with higher income levels were more likely to undergo laparoscopic appendectomy. These data suggest that patient factors have little influence on the management of appendicitis and outcomes are similar across all racial groups and socioeconomic levels in a system with equal healthcare access.

65. SURGICAL MANAGEMENT OF CHRONIC GASTROINTESTINAL PSEUDO-OBSTRUCTION

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Surgical Management of Chronic Gastrointestinal Pseudo-Obstruction.

Background: Chronic gastrointestinal pseudo-obstruction can manifest anywhere in the GI tract and is characterized by recurrent signs and symptoms of obstruction, and lack of mechanical obstruction. These patients represent a diagnostic and therapeutic dilemma for the surgeon, as many will undergo exploration as part of the initial diagnosis, or when present with recurrent disease. Those whose symptoms are intractable to medical management may benefit from certain surgical interventions. The purpose of this study was to review the surgical management of chronic gastrointestinal pseudo-obstruction.

Methods: We reviewed the records of thirty one patients with gastrointestinal pseudo-obstruction who were seen from 1995 to 2007 and had undergone operative intervention. Diagnosis was made via manometric, radiologic or endoscopic evaluations, and mechanical obstruction was ruled out. Patients undergoing an operation had failed optimal medical management with continuing symptoms.

Results: There were 17 females and 14 males. Average age at diagnosis was 31 years (6-61). Thirteen patients had predominantly single organ involvement (stomach, small bowel, or colon). Most had involvement of two or more organs. In two patients the entire GI tract was affected.

The most common indications for operations were to rule out obstruction and intractable symptoms. Others included inability to tolerate a diet, recurrent line infections and sepsis. The most common operations were a gastrostomy tube (26), a jejunostomy tube (17) and small bowel resection (17). Many underwent exploratory laparotomies (14) with or without lysis of adhesions (11), colectomy or small bowel bypass. In carefully selected situations procedures such as ostomy formation, gastric pacemaker implantation, and small bowel transplantation were performed. Twenty five patients (80%) had more than one operation, with an average of 3.9 operations per person. Twenty two (70%) patients had at least temporary improvement in their symptoms after surgical intervention.

Conclusion: Patients with chronic gastrointestinal pseudo-obstruction represent a diagnostic and therapeutic challenge for the surgeon. Patients often require repeated surgical evaluations and multiple operations. Surgical treatment is beneficial if tailored to the extent and location of the disease.

66. INTRAOPERATIVE PTH MONITORING IS MANDATORY WITH LIMITED EXPLORATION FOR PRIMARY HYPERPARATHYROIDISM

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Introduction: Intraoperative measurement of parathyroid hormone (IOPTH) has been widely accepted as an important adjunct to directed parathyroidectomy for primary hyperparathyroidism. Yet because this assay is not available in many institutions, some surgeons have adopted directed parathyroidectomy without use of IOPTH. We reviewed our experience with directed parathyroidectomy in order to estimate the impact of IOPTH on intraoperative decision making. We hypothesized that IOPTH changes the operative plan often enough to mandate its routine use.

Method: We reviewed our experience with directed parathyroidectomy for primary hyperparathyroidism from 2002-2008. Patients with genetic disease or previous failed exploration were excluded from analysis. All patients underwent directed parathyroidectomy based on ultrasound and sestamibi imaging Results. If imaging was negative, exploration was terminated when a gland was removed with an appropriate fall in IOPTH. IOPTH was deemed to have an impact on the surgical decision when either: 1) IOPTH did not fall adequately after resection of a putative adenoma thereby prompting further exploration, or 2) visualization suggested the need to remove multiple glands but the IOPTH fell after removal of fewer glands thereby limiting resection. Adequate fall of IOPTH was defined as >50% reduction after 10 minutes.

Results: 153 parathyroidectomies were performed. In these, the IOPTH impacted intraoperative decision-making in 24 (16%). In 21 cases levels did not adequately fall after initial resection of an enlarged gland, thereby prompting a search for additional glands. In 2 cases preoperative imaging had suggested multiple gland disease, but IOPTH fell after removal of the first gland thereby limiting the extent of surgery. In 1 patient, intraoperative visualization suggested asymmetric hyperplasia, but after resection of the largest gland the IOPTH fell appropriately thereby limiting resection. Hyperparathyroidism persisted in only 2 patients. One of these had an early failure despite meeting the criteria for IOPTH decline. Resection of a putative adenoma based on imaging or limited visualization alone would have been successful in 86% of cases. Overall, with the IOPTH assay the success rate was 99%.

Conclusion: Use of IOPTH is mandatory with limited parathyroid exploration.

67. LOCALIZING THE ELUSIVE PARATHYROID ADENOMA

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Introduction: Surgery for parathyroid disease has evolved from routine four gland exploration to focused exploration and excision of preoperatively localized abnormal glands along with intraoperative PTH monitoring. Sestamibi scans have greater than 90% sensitivity to localizing a single adenoma, thereby reducing the need for four gland exploration. A small group of patients with primary hyperparathyroidism still require four gland exploration if the adenoma does not localize with preoperative imaging. The metabolic activity of a parathyroid adenoma triggers the uptake of ^{99m}Tc-Technetium during Sestamibi scanning. Nonlocalization of an adenoma may be related to low metabolic activity of a gland, particularly if it is early on in the course of the disease. Bisphosphonates have been reported to augment the metabolic activity of parathyroid tissue and may aid in the preoperative localization of an adenoma with Sestamibi scanning. This study reviews our initial experience using bisphosphonate induced Sestamibi scanning in localizing a parathyroid adenoma following an initial negative Sestamibi scan.

Methods: Seven patients were referred to our group of surgeons for surgical treatment of primary hyperparathyroidism. All seven patients had preoperative Sestamibi scans that initially did not localize to any specific gland. Patients were treated with alendronic acid followed by repeat Sestamibi scan according to the following algorithm: 70mg by mouth on day 1 and day 8, and scanning on day 15. Successful localization was confirmed at surgical exploration with resolution of hypercalcemia and normalization of parathyroid hormone levels. Initial and follow up scans were reviewed by a single blinded radiologist.

Results: In all cases, the repeated Sestamibi scan localized to one region after the short course of bisphosphonates. All patients then underwent a directed parathyroidectomy with rapid PTH drawn during surgery. The preoperative Sestamibi scan identified the correct gland in all seven cases and the PTH assay during surgery dropped greater than 50% of the pre-incision level after the excision of the adenoma. The postoperative course was uneventful and the patient's hypercalcemia and elevated PTH levels have normalized after surgery confirming a biochemical cure.

Conclusion: Bisphosphonates improve the yield of preoperative Sestamibi scanning and should be attempted prior to routine four gland exploration in patients with primary hyperparathyroidism.

68. RESIDENT MINIMALLY INVASIVE SURGERY SYMPOSIUM AFFIRMS CAREER AMBITIONS

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Background: Minimally invasive surgery (MIS) skill acquisition has become a vital part of surgical residency training. Residency programs have thus adopted simulation curricula for this purpose. This study examined the impact of a single day MIS training symposium on general surgery residents' interest in MIS as a career.

Methods: Ten surgery residents, years 1-4, at a single academic institution participated in a two part symposium. Part 1 included lectures on basic MIS procedures. Part 2 included an animal lab where residents performed MIS procedures. Symposia surveys acquired participant impressions following the course & 3 months later. A numeric scale 1: no interest/ influence to 10: strong interest/ influence was used to assess relative interest, confidence, importance to training & likelihood of a career in MIS. Residents were queried on the relative importance of a single day MIS symposium. For each topic residents were categorized into 3 groups: High scoring the topic >6, Medium scoring the topic 5-6, or Low scoring the topic <5.

Results: Interest in MIS immediately following the symposium: 70% of residents were in the High interest category & 20% in the Low interest category. This remained unchanged at 3 months.

Confidence in MIS skills immediately following the symposium: 50% of residents were in the High confidence category & 20% in the Low confidence category. This improved to 50% High confidence & 10% Low confidence at 3 months.

Importance of MIS in overall residency training immediately following the symposium: 90% of residents felt this was of High importance & 0% felt this was of Low importance. This increased to 100% replying this was of High importance & 0% replying this was of Low importance at 3 months.

Future utilization of MIS skills immediately following the symposium: 56% of the residents had High expectations of using MIS in the future & 28% had Low expectations of using MIS in the future. This improved to 61% with High expectation & 28% with Low expectation of using MIS in the future 3 months following the course.

Alteration in career path immediately following the symposium: 11% of residents were in High likelihood of career alteration & 78% were in Low likelihood of career alteration. This remained unchanged at 3 months. Overall residents felt that a single day MIS symposium was important in the overall training of surgery residents and in affirming their desire to pursue their anticipated careers.

Conclusion: Residents felt that MIS skill acquisition is important in a training program. Most were interested in MIS prior to the symposium and were affirmed in their aspirations for a career in MIS thereafter. Those few who were not interested in a career

incorporating MIS remained with that intention. Overall residents responded that a single day MIS symposium was important in the overall training of surgery residents and in affirming their career choices.

69. RETROPUBIC VERSUS TRANSOBTURATOR APPROACH FOR SUBURETHRAL SLING PLACEMENT IN THE TREATMENT OF STRESS URINARY INCONTINENCE: THE GENERAL SURGEON'S PERSPECTIVE

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Background: Two well established surgical approaches exist for placement of a suburethral sling to treat female stress urinary incontinence: retropubic and transobturator. The transvaginal retropubic approach requires a vaginal incision with blind passage of trocars to a suprapubic location while attempting to maintain proximity to the back of the pubic bone. The transobturator approach requires passage of mesh through the medial compartment of the obturator fossa to avoid pelvic viscera and vessels. The FDA has issued a notification of serious complications associated with these procedures to include bowel and vascular injuries. It has been reported that over 1.5 million of these procedures have been performed in the U.S. to date; therefore, it is important for general surgeons to be aware of the potential risks of these procedures. Presentation of complications may be delayed and require operative repair. Initial evaluation of these patients should take this into consideration in the differential diagnosis.

Methods: A literature search of all publications from 1996-2008 was completed using the following search terms: "tension free vaginal tape," "complications," and "suburethral sling." The literature search was limited to English language publications with human subjects. Publications were reviewed and excluded if the number of subjects was <10, or if complication rates were not reported by approach. A follow-up of ≥ 7 days was required. Data were grouped by operative approach (retropubic vs. transobturator). Statistical analysis included Chi square for comparison of reported complications.

Results: Fourteen publications met inclusion criteria. 6256 subjects were included in the retropubic group, and 3260 in the transobturator group. The reported success/cure rates were 89.4% in the retropubic group and 93.7% in the transobturator group. Complication rates of bladder injury in the retropubic vs. transobturator group were 3.9% vs. 0.5% ($P=.001$). Bowel injuries occurred in 0.3% of those in the retropubic group, and 0% in the transobturator group ($P=.999$). Urethral and vascular injuries in the retropubic vs. transobturator group were 5.9% vs. 0.3% ($P=.001$) and 0.3% vs. 0% ($P=.999$), respectively. Incidences of bleed and hematoma for the retropubic group vs. the transobturator group were 2.2% vs. 3.0% ($P=.017$) and 2.1% vs. 0% ($P=.004$), respectively.

Conclusion: Suburethral slings offer a successful treatment for female stress urinary incontinence. While both the retropubic and transobturator approach result in high success/cure rates, the retropubic approach has a higher rate of bladder, bowel, urethral, and vascular injury as well as a higher rate of hematoma. The volume of these procedures performed to date coupled with a significant inherent complication rate supports the need for general surgeons to be familiar with the risks. Surgeons should have a heightened awareness to avoid missing injuries associated with this common surgical treatment.

70. ROUTINE PRE-OPERATIVE CHEST X-RAY FOR NON-THORACIC OPERATIONS – WORTHWHILE OR UNNECESSARY?

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Background: Chest x-ray is often obtained for routine evaluation prior to elective surgery. The goal of routine pre-operative chest x-ray is to discover abnormalities that alter pre-operative planning and to identify individuals at elevated risk for post-operative pulmonary complications.

Specific Aims: (#1) Report the incidence of an abnormality found on routine pre-operative chest x-ray.
(#2) Determine the number of times routine chest x-ray triggered additional evaluation.
(#3) Correlate pre-operative chest x-ray abnormalities with post-operative pulmonary complications.

Methods: A retrospective observational study was performed on patients who underwent elective non-thoracic operations by the general surgery service at an urban referral VA Medical Center. Pre-operative chest-x-ray was defined as the most recent chest x-ray within six-months of the operation. The VA National Surgical Quality Improvement Program database was used to quantify pulmonary outcomes. Post-operative pulmonary complications were defined as pneumonia, failure to wean from ventilator (> 48 hours) and re-intubation. Statistical analysis included univariate analysis (t test and chi-square). Results reported as mean \pm standard deviation.

Results: Over 3 years, 508 subjects (average age 60 ± 12 years) were studied. Pre-operative chest x-ray was obtained in 448 (88%).
(#1) One or more abnormalities were found on 254 (57%) of pre-operative chest x-rays. The most common incidentally found abnormalities included: chronic obstructive pulmonary disease 104 (41%); pulmonary nodule/granuloma 60 (23%) and atelectasis 38 (15%).
(#2) Abnormalities on pre-operative chest x-ray lead to further diagnostic evaluation in 5% (22/448). Three (0.7%) subjects required an unplanned intervention. One (0.2%) subject had their operation postponed due to a newly diagnosed pneumonia.
(#3) Pulmonary complications occurred similarly in subjects with an abnormality on pre-operative chest x-ray 5.5% (14/254) as compared to subjects with no abnormality on pre-operative chest x-ray 3.6% (7/194) ($p=0.37$).

Conclusion: (#1) Abnormalities are found on more than half of all routine pre-operative chest x-rays.
(#2) Routine pre-operative chest x-ray has minimal effect ($< 1\%$) in uncovering additional findings which alter pre-operative decision making.
(#3) Routine pre-operative chest x-ray is not useful in predicting the occurrence of post-operative pulmonary complications.
••• Our findings suggest routine pre-operative chest x-ray is not a valuable clinical tool.

71. DOES THE ANATOMIC SITE OF NECROTIZING FASCIITIS AFFECT PATIENT OUTCOME?

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Background: Past data suggested that necrotizing fasciitis (NF) of the extremities with associated monomicrobial *Staphylococcus aureus* infection have more favorable outcomes than NF of the trunk/perineum. Our goal is to determine the impact of evolving bacteriology on patient outcomes based on the anatomic site of NF.

Method: Records of 39 County patients (mean age: 47.7 years; 84.6% male) admitted between 2004 and 2008 with proven NF on pathology were reviewed. Mortality was the main outcome of the study. Secondary outcomes included bacteriology, anatomic site of infection, antibiotics, hours to first debridement (DB), number of DB, and length of stay (LOS).

Results: The mortality rate by anatomic site was similar. Monomicrobial infection with *Streptococcus pyogenes* was significantly more prevalent in NF of the extremities, while polymicrobial infections were more common in the trunk/perineum. Appropriate antibiotic treatment decreased the number of DB ($p=0.02$), but did not affect outcomes. LOS, time to first debridement, and number of debridement were similar between the two groups.

Conclusion: In our study, NF of the extremities was associated with monomicrobial *Streptococcus pyogenes* infections and had a higher mortality rate than previously reported, comparable to NF of the trunk/perineum.

72. THE NATIONAL FREQUENCY OF GASTROINTESTINAL PEDIATRIC SURGERY IN HOSPITALIZED NEONATES

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Background: The desired number of pediatric surgeons needed within the United States is difficult to estimate as it is unclear how many neonates across the country require pediatric surgical intervention. Furthermore, the outcome of these sick and often premature children has not been well-characterized. The purpose of this study was to evaluate the frequency of gastrointestinal surgery in the U.S. neonatal population according to birth weight. We hypothesized that gastrointestinal surgery is more common in those neonates born premature and the resulting mortality and length of stay (LOS) would correlate to birth weight.

Methods: Neonates were identified by their Diagnosis Related Group from the Kids' Inpatient Database which contains pediatric discharge data collected from all U.S. Hospitals within one year. The neonates were divided into birth weight groups of <1500g (group I), 1500-2499g (group II), and >2500g (group III). The more common gastrointestinal diagnoses and procedures were defined using ICD-9-CM codes (gastrostomy, fundoplication, gastroschisis/omphalocele, necrotizing enterocolitis, and intestinal malrotation). Length of stay and in-hospital mortality were also recorded.

Results: 5118 neonates were identified in group I, 2822 in group II, and 7242 in group III for a total of 15,182 neonates undergoing gastrointestinal surgery yearly in the U.S. Procedures for necrotizing enterocolitis were significantly more common in group I (23% of all neonates <1500gms compared to 11% in group II and 4% in group III, $p<.05$), whereas gastrostomy (9% I, 14% II, 12% III), fundoplication (6% I, 8% II, 8% III), and intestinal malrotation (<1% I, 5% II, 8% III), were more common in neonates >1500gms. Gastroschisis/omphalocele was most common in group II (22%) compared to group I (<1%) and group III (14%), $p<.05$. Mean length of stay was significantly different between the groups at 83 days for group I, 43 days for group II, and 27 days for group III ($p<.05$). Mortality also was different at 17%, 8%, and 4%, respectively ($p<.05$).

Conclusion: A large number of neonates in the U.S. require major gastrointestinal surgery. Other than necrotizing enterocolitis, gastrointestinal surgery is more common in children born over 1500grams. Hospital length of stay and mortality associated with the more common procedures are directly related to birth weight.

74. INCIDENCE OF VENOUS THROMBOEMBOLISM IN SEVERE TRAUMATIC BRAIN INJURY

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Background: Traumatic brain injury (TBI) is a significant risk factor for venous thromboembolism (VTE) and is often directly associated with a contraindication for pharmacologic prophylaxis. This study was designed to characterize the nature of VTE in this population at a state designated level 1 trauma center, and to evaluate the use and efficacy of screening venous duplex ultrasound.

Methods: A review of the trauma registry from September 2003 to September 2008 identified patients with a Glasgow Coma Scale of 8 or less secondary to TBI, and a hospital length of stay 7 days or greater. Analyses of this population included patient demographics, Injury Severity Score, hospital length of stay, venous duplex screening, time between ultrasound examinations, incidence of VTE, location of VTE, and percentage of positive venous duplex ultrasound examinations.

Results: 128 patients met inclusion criteria. 30.5% (n=39) received lower extremity venous duplex ultrasound, 13.3% (n=17) received upper extremity ultrasound, and 9.4% (n=12) received both. 55 sets of lower extremity duplex ultrasound examinations were performed, with 27.2% (n=15) yielding a new diagnosis of deep venous thrombosis. The incidence of VTE was 12.5% (n=16), with the incidence of pulmonary embolism 1.6% (n=2). Of this group, 18.75% (n=3) had isolated upper extremity VTE, 75% (n=12) had isolated lower extremity VTE, and 6.25% (n=1) had both upper and lower extremity VTE.

Conclusion: The incidence of VTE in patients with TBI is common. The majority of TBI patients with DVT are asymptomatic. A venous duplex screening program in this population is warranted to minimize missed diagnoses and reduce the risk of potential morbidity and mortality.

75. ACUTE CARE SURGERY AT A COMMUNITY LEVEL II TRAUMA CENTER: IT CAN WORK.

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Introduction: The care of the emergency general surgery/trauma patient presents major challenges to an increasingly over-burdened health care system. One suggested model to meet these growing demands has been the development of an acute care surgery (ACS) team. As with the establishment of any new program, the question remains: How does it work?

Methods: At our urban level II trauma center, three acute care attending surgeons (ACA) were recruited to join three established surgeons to create an ACS team. Each ACA (surgeons A, B, and C) was paid a fixed salary and took an average of five calls per month. Four other established surgeons were no longer included in the call schedule. Case logs, hospital activities, and scientific productions of each ACA were reviewed over a two year time period from August 2007 to August 2009. In addition, an interview was conducted with each of the surgeons no longer taking call and all newly recruited surgeons hired after the creation of the ACS team.

Results: From August 2007 to August 2009, the ACAs performed an average of 204 major general surgery procedures (A-186, B-220, C-206). In this same time period, the ACAs had an average of 317 trauma admissions (A-322, B-359, C-272) and performed an average of 28 trauma laparotomies (A-27, B-32, C-26). In addition, the ACAs performed many typical intensive care unit (ICU) procedures including percutaneous tracheostomy, percutaneous endoscopic gastrostomy, central venous catheter, chest thoracostomy, and bronchoscopy. Overall, billing collections by the ACS surgeons averaged 54 percent of their salary over the study period. By not requiring new surgeon hires to participate in the call rotation, the hospital was able to recruit an additional hepatobiliary (HB) surgeon, a bariatric surgeon, and an advanced laparoscopic surgeon to join the surgical staff. Two of the four established surgeons no longer taking call stated they were able to expand their elective practices (the other two surgeons left our institution to pursue other career opportunities). In addition to required duties, the new ACAs also became involved in hospital activities such as: developing a surgical skills lab, leading ICU multi-disciplinary rounds, writing scientific papers, attending weekly conferences, actively assisting on the hepatobiliary service, and serving on hospital committees among other things.

Conclusion: The ACS model can work well at a community based level II trauma hospital. In addition to the care of both trauma and acute general surgery patients, ACAs can fill many other roles within a hospital. The presence of ACAs allows other surgeons to more effectively build elective practices and makes it easier for a hospital to fill niche surgical positions. Hospitals, surgical staff, and patients stand to benefit from establishing an acute care surgical model at a community hospital.

76. THE INTRODUCTION OF THROMBOELASTOGRAPHY TO THE SURGICAL INTENSIVE CARE UNIT WITH A COMPARISON TO STANDARD COAGULATION TESTS

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Background: Thromboelastography (TEG) was developed for and is now widely used during cardiac bypass to monitor coagulation. Along with other data, TEG produces the r time (RT, normal 4 - 8 seconds), the angle (A, normal 47 - 74°), the maximum amplitude (MA, normal 54 - 72 mm) and an overall coagulation index (CI, normal -3 to 3). Coagulation factor function is measured by the RT, fibrinogen function by the A and platelet function by the MA. In 2007 a TEG machine was placed in this SICU and the SICU nurses were trained to run it.

Methods: The TEGs done in this SICU are reviewed and the TEG data compared to traditional coagulation tests. The coagulation data collected for comparison include the international normalized ratio (INR) and the partial thromboplastin time (PTT) that were drawn within three hours of the TEG. Data are excluded if the patient received any blood products or medications between the time of the TEG and the time of the PT and PTT that might alter coagulation or platelet function.

Results: With 10 to 15 minutes of nursing time, in one hour a TEG is complete. It soon became frequently used, especially for detecting hypocoagulopathy caused by platelet inhibitors and hypercoagulopathy postoperatively and in trauma patients. From October 2007 through August 2009, 220 TEGs were done on 130 patients. Of these, 107 TEGs have an INR and PTT for comparison. With coagulopathy defined as PT > 1.9 or PTT > 36.6 seconds, the TEG RT has a sensitivity of 88%, a specificity of 59% and an overall accuracy of 80% for predicting coagulopathy. The TEG CI has a sensitivity of 95%, a specificity of 59% and an accuracy of 86%. There are 79 cases where the INR<2.0 and the PTT is normal yet the TEG CI indicates hypercoagulopathy (CI>3) in 25 (32%) and hypocoagulopathy (CI<-3) in four (5%). In the 25 hypercoagulopathies, 19 (76%) have an elevated MA with 13 of the 19 also having an increased A, one has normal MA but an increased A and five have normal MA and A but the RT is short. In the four hypocoagulopathies, two have abnormally low MAs. Thus, of the 29 coagulopathies detected by TEG CI but not by PT or PTT, at least 22 (76%) are probably due to platelet and/or fibrinogen dysfunction and five (17%) due to coagulation factor dysfunction.

Conclusion: Using thromboelastography in the SICU is convenient and efficient. Not only is it accurate in demonstrating the coagulation defects shown by standard coagulation tests, but it also demonstrates defects in platelet and fibrinogen function, particularly hypercoagulopathies, that are not detectable by the INR or PTT. Using TEG, the dominant etiology of the coagulopathy, either platelet, fibrinogen or coagulation factor dysfunction can be detected. It is useful for determining when the

critically ill surgical or trauma patient becomes hypercoagulable and thus might benefit from anti-thrombosis prophylaxis and for monitoring the effect of enoxaparin and anti-platelet agents such as aspirin and clopidogrel.

77. TRAUMA ASSOCIATED PNEUMONIA IN VENTILATED PATIENTS

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Background: Trauma associated pneumonia (TAP) in intubated patients may occur as a result of community acquired infection, secondary to aspiration, or prolonged mechanical ventilation. Its incidence has been shown to occur in 20-40% of trauma patients receiving ventilator support. This study is intended to compare the incidence of TAP in adult trauma patients using clinical and bacteriologic definitions of pneumonia.

Methods: 146 trauma patients who were ventilated for greater than 48 hours were prospectively evaluated in the trauma ICU. The clinical pulmonary infection score (CPIS) and quantitative culture Results from bronchoalveolar lavage (BAL) were collected and utilized to define TAP.

Results: 71 patients (48.6%) met the clinical definition of pneumonia (CPIS >6) and 53 patients (36.3%) met the bacteriologic definition of pneumonia (>10⁴ organisms on quantitative culture). 82 patients had a BAL (24 CPIS <6; 58 CPIS >6), of which 64.6% met the criteria for TAP. CPIS did not predict whether the BAL would exceed 10⁴ organisms. However, of those who had a CPIS >6 and a BAL, 80.6% met the quantitative criteria level of 10⁴ organisms while 19.4% met the criteria at 10⁵ organisms compared to 52.9% and 47.1%, respectively, with those who had CPIS <6 (p=0.037).

Conclusion: CPIS was not predictive of pneumonia when compared to quantitative culture Results. Therefore, BAL should be used for the diagnosis of TAP based on clinical rationale and not the CPIS scoring system.

79. IN-HOUSE COORDINATOR PROGRAMS IMPROVE CONVERSION RATES FOR ORGAN DONATION

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Background: The organ supply shortage continues to be a public health care crisis, with nearly 20 people dying each day, awaiting transplantation. Inability to obtain consent remains one of the major obstacles to donation. We hypothesize that the presence of in-house coordinators (IHC) from organ procurement organizations (OPO) will improve organ donor conversion rates.

Methods: This is a retrospective database analysis of patients from three Academic Medical centers with IHC programs in place who were referred to the regional OPO for possible organ donation. Data regarding organ donation demographics were compared before (Pre-IHC) and after (Post-IHC) the establishment of an IHC program. The main outcome measures were conversion and family decline rates. The conversion rate was calculated as the number of actual donors divided by the number of potential donors and is represented as a percentage. The IHC functioned to survey for potential donors, ensure timely referral, provide hospital staff education, assist with family consent and donor management, and provide family support.

Results: Post-IHC was associated with a significantly lower family decline rate (6% vs. 18%, p<0.001), a significantly higher consent for research rate (8% vs. 0.4%, p<0.001) and a significantly higher conversion rate (77% vs. 63%, p=0.007) compared to Pre-IHC. In addition, a significant increase in referrals/day (0.35 vs. 0.27, p<0.05) was noted with Post-IHC.

Conclusion: The presence of an IHC program significantly improves conversion rates for organ donation. An IHC program should be considered as a viable option to bridge the gap between organ supply and organ demand.

80. MECHANISM ASSOCIATED MORTALITY OF TRAUMATIC CERVICAL SPINE INJURY IN ELDERLY PATIENTS

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Introduction: To evaluate outcomes of cervical spine injuries in octogenarians caused by different mechanisms: motor vehicle accidents versus falls.

Methods: The National Trauma Data Bank (NTDB) was queried for cervical spine injuries (CSI) in patients aged 80 and above. Results for the two most common mechanisms of injury, motor vehicle accident (22%) and falls (78%) were compared. Variables analyzed included age, Glasgow Coma Scale (GCS), Injury Severity Score (ISS), days in Intensive Care Unit, temperature on arrival, blood pressure on arrival, CT-scan Results, complications, sex and mortality. There were a total of 5,442 patients with CSI that were included in the study. Statistical analysis was performed using student t-test, Chi-squared test and multivariate analysis with a value of $p < 0.05$ considered statistically significant.

Results: Eighteen percent of octogenarians with cervical spine injuries died. It was observed that patients in the motor vehicle accident group had 1.737 (95% CI 1.407, 2.144 p -value < 0.0001) times the odds of dying, compared to those in the fall group. Patients over the age of 80 who were in a motor vehicle accidents had 1.209 (95% CI 0.941, 1.554 p -value = 0.1372) times the odds of having a positive head CT, compared to people over the age of 80 who experienced a fall. Patients involved in a motor vehicle accident with associated CSI were more likely to be a younger age, have a lower GCS on arrival, a longer length of stay in the Intensive Care Unit, and a higher ISS ($p < 0.05$). Patients with a CSI after a fall were more likely to be hypertensive and hypothermic on arrival.

Conclusion: Cervical spine injury in octogenarians carries a high mortality regardless of mechanism. Elderly patients who suffer cervical spine injuries in motor vehicle accidents are nearly twice as likely to die as those who were injured in a fall.

81. SPLENIC ARTERY EMBOLIZATION FOR BLUNT TRAUMATIC SPLENIC INJURY

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Background: Blunt traumatic splenic injury can be managed nonoperatively. Splenic artery embolization has been shown to be an alternative in nonoperative management for the hemodynamically stable patient. This study evaluates the outcomes of splenic embolization at a Level I trauma center.

Methods: A retrospective study was performed of all patients from April 1999 to June 2009 who underwent splenic artery embolization after traumatic splenic injury. Charts were reviewed for mechanism of injury, splenic grade, scheme of treatment, and embolization outcomes.

Results: Forty-eight patients underwent splenic artery embolization. There were 33 males and 15 females with an average age of 39 (range 15 - 73). Mechanisms of traumatic splenic injury included motor vehicle or motorcycle collision, fall, and assault. The average splenic grade for embolization was 3 (range 1-5) as diagnosed by CT scan. Twenty-five (52%) of those patients were initially conservatively managed in the ICU or on the floor before attempted embolization. Two patients (4%) failed embolization requiring splenectomy in addition to one patient who died from unrelated pulmonary complications. Four patients required additional blood transfusions after embolization for hemodynamic stability; however, they did not require any additional interventions thereafter. There were no reported complications from the embolization procedure.

Conclusion: Splenic artery embolization can be an effect alternative to the management of splenic injury with a high success rate (96%). Embolization can be performed for all different grades of splenic injury. There were no reported complications resulting from the embolization procedure.

82. INJURY PATTERNS ASSOCIATED WITH NONCOASTAL PERSONAL WATERCRAFT ACCIDENTS

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Background: Five thousand boating accidents occurred in the United States in 2007, of which 24% involved personal watercraft (PWC). There has been a significant evolution in PWC since their initial availability in the 1970's from single passenger vehicles with 60-80 horsepower to multiple passenger vehicles that reach speeds of 70 mph. Despite this no formal training in their operation is required. The objective of our study was to evaluate the patterns of injury seen with PWC accidents on noncoastal waterways in order to provide recommendations on safety training and equipment use.

Methods: A retrospective review of patients injured while using PWC from January 1, 2000 to December 31, 2008 was conducted. Patient data were summarized and injury patterns evaluated.

Results: Twenty-four patients were identified. Mean age and ISS were 29.8 years and 6 respectively. The majority of patients were men (62.5%) that were admitted as Level 2 trauma admissions (77.3%). Most common mechanism was described as "fell or ejected from PWC" (n=11, 45.8%), followed closely by PWC collisions with other watercraft (n=7, 29.2%) and collisions with stationary objects (n=4, 16.7%). Thirteen patients (59.1%) arrived intubated, three required ICU admission, and two required mechanical ventilation during their hospitalization. Head injury was the most common injury, affecting nine patients (37.5%), consisting of six concussions, two subdural hematomas, and one subarachnoid bleed. This was followed by pelvic (n=3) and extremity injury (n=4). One patient with a pelvic injury and three with extremity injuries required surgery. Other injuries included one pneumothorax, one duodenal hematoma, and one vaginal tear. There were no vascular injuries. ICU length of stay for those requiring ICU admission was 4.7 days, and average duration of mechanical ventilation was 2 days in those requiring it. Hospital length of stay was 4.6 days. There were no deaths among injured patients. Twenty one patients (87.5%) were discharged to home with the remainder discharged to a rehabilitation facility (n=3, 12.5%).

Conclusion: Head injury is the most common injury seen with PWC accidents followed closely by musculoskeletal injury to the pelvis and extremities. Our study population suffered fewer spine injuries, which is thought to be secondary to less "jumping" of PWC on noncoastal waters. Helmet use may decrease most common injuries which were neurologic. Additionally, we feel that basic owner education on the operation of these vehicles and increased regulation on their use could dramatically reduce PWC accidents and therefore injuries associated with their use.

83. CT DIAGNOSIS OF NON TRAUMATIC PATHOLOGY IN INJURED PATIENTS: DOES AGE MAKE A DIFFERENCE?

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Background: CT scans are increasingly being used in the evaluation of trauma patients. Scanning for potential injuries related to trauma also allows the discovery of non traumatic pathology (NTP). The management of these findings, depending on their clinical significance, is an added demand to an already busy trauma service. The purpose of this study was to investigate the incidence of NTP in trauma patients, and to compare this incidence to age, number of CT scans, and ISS.

Methods: Patients from January 1, 2007 to December 31, 2007 that were fourteen years old or greater at the time of their assessment were included. Demographic data such as age, race, sex, and ISS were collected from the trauma registry. The attending radiologists' reports of all CT scans obtained within 24 hours of the patients' arrivals were read and incidental findings were catalogued. Incidental findings were categorized by potential clinical significance. Patients were divided into two groups based on age: 14-55 (Group 1, n=1297) and >55 (Group 2, n=272) to compare the incidence of NTPs in the younger and older populations. T-tests and logistic regression analysis were used to estimate the mean differences and the effect size.

Results: 1569 patients met inclusion criteria for this study with a mean age of 37.4(+16). The median age of the patients was 30 (14-55) for Group 1 and 64 (56-95). The mean ISS in Group 1 and 2 was 13.87(+12.68) and 17.46(+12.95) respectively while the mean number of CT scans were 2.7 (+1.1) and 2.9(+1.07) respectively. Both mean ISS scores (P<0.0001) and mean number of CT scans (P=0.01) across the two groups were significantly different. The number of NTP in Group 2 (n=248, 91%) was significantly higher than in Group 1 (n=877, 67%) (P<0.0001). On a multivariate analysis age was an independent predictor for NTP findings with significantly higher odds of finding NTP [OR= 7.6(4.5-14.2)] in Group 2, whereas an increase in the number of CT scans did not significantly increase the likelihood of detecting NTPs.

Conclusion: We observed an increased incidence of NTP in older patients evaluated for traumatic injury, with a significantly higher odds of detecting NTP in patients >55 years of age. The increase in the number of CT scans does not appear to increase the likelihood of detecting NTPs.

84. UTILITY OF PATHOLOGIC EXAMINATION FOR SPECIMENS DERIVED FROM OPERATIONS FOR TRAUMA

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Background: Trauma operations frequently result in the removal of surgical specimens that are submitted to the pathology department for gross and microscopic examination. At large trauma centers with high operative volumes, this routine practice places an added burden to the pathology department and increases hospital costs. The objective of this study was to review the incidence and clinical impact of abnormal findings in surgical specimens from trauma operations.

Methods: All pathology reports of specimens obtained during a laparotomy or thoracotomy for trauma at a Level 1 trauma center from 01/01/03 to 12/31/07 were reviewed retrospectively. Pathology reports were examined to identify findings other than traumatic injury. Abnormal findings were assessed for malignancy, infectious processes, or chronic inflammatory changes. Clinical management and demographic data were obtained from individual chart review. The primary outcome measurement was a change in clinical management resulting from the pathology report. Abnormalities were considered clinically significant if they resulted in a change in hospital management or required outpatient follow-up.

Results: During the 5-year study period, 587 specimens were obtained during the initial trauma operation in 643 patients. The most common specimens were 195 spleen, 172 small bowel, 101 colon, 35 kidney, 19 liver and 18 lung. There were 57 abnormal findings (9.7%) with 17 (2.9%) considered clinically significant. Patients with abnormal pathology reports were significantly older than patients with normal reports (40.1 vs. 33.7, $p=0.009$).

Conclusion: The submission of trauma specimens to pathology for examination has a role in identifying occult disease. Many of these findings result in clinically significant changes in management. This study suggest that patients older than 40-years old would be more likely to have abnormal findings and should routinely have surgical specimens evaluated by pathology.

85. SEQUENTIAL ULTRASOUND EXAMINATION OF TRANSPLANTED LIVER ALLOGRAFTS CORRELATE WITH ISCHEMIA-REPERFUSION INJURY AND PROVIDE CLINICALLY RELEVANT INFORMATION ON VASCULAR SUPPLY

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Background: Portable ultrasound equipment with sophisticated Doppler capacity facilitates sequential evaluation of transplanted liver allografts (TLA) from reperfusion through recovery. This study evaluates TLA vascular patterns within the initial 7 days following liver transplantation (LTX).

Methods: Retrospective analysis of 248 LTX completed at two institutions between 09/05 and 08/09 was preformed. Doppler evaluation of the TLA included intra-operative reperfusion with sequential follow-up for 7 days. Portal vein, hepatic vein, and hepatic arterial signals were scored for waveform, flow, systolic and diastolic velocity by an attending radiologist blinded to patient data. Vascular patterns were correlated with donor characteristics (age, serologies, acid/base, procurement type: donation after brain death, donation after cardiac death, living-donation), cold ischemic time, warm ischemic time, ischemia-reperfusion (I/R) injury (aspartate aminotransferase [AST] > 25X upper normal limit), and pattern of I/R recovery.

Results: Normal hepatic arterial, portal venous, and hepatic venous waveforms were observed in >90% of TLA at reperfusion. Abnormal hepatic arterial waveforms at reperfusion (7%) demonstrated poor diastolic flow and significantly correlated with LTA obtained from donors who experienced physiologic injury as evidenced by markedly elevated transaminases (>5X upper normal limit) or metabolic acidosis ($p<0.05$). Conversion from tri-phasic to mono-phasic hepatic venous flow within 24hr of LTX also correlated with I/R injury and returned to baseline later than liver function. A rapid surgical learning curve coupled with sequential examinations provided convincing evidence to explore six patients for suspected hepatic arterial and portal venous thrombosis prior to clinical indications thereby preserving TLA function and avoiding graft related complications.

Conclusion: Sequential ultrasound interrogation of transplanted liver allografts incorporating data obtained from the moment of reperfusion demonstrate characteristic changes associated with I/R injury and provide clinically significant information with respect to vascular supply.

86. SURGICAL STAPLERS DO NOT IMPROVE PERIOPERATIVE OUTCOMES FOR RESECTION OF HEPATOCELLULAR CARCINOMA

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Background: Recent surgical literature has suggested that surgical staplers do not improve perioperative outcomes compared to other techniques, such as the crush clamp technique, for parenchymal resection of liver tumors. It remains unclear if utilizing a surgical stapler is beneficial to patients with hepatocellular carcinoma (HCC) who often have some degree of cirrhosis. The purpose of this report is to describe the outcomes associated with surgical stapler use in hepatic resection for HCC.

Method: A prospective database was queried for patients at a high volume cancer center who have undergone resection for HCC. Demographic, operative, surgical technique, and outcome data were collected. Perioperative outcomes were compared on the basis of the use of surgical stapling devices during hepatic resections. Two-tailed Fisher's exact test and Student's t-test were used to determine significance. Uncertainties are standard deviations.

Results: We identified 164 patients who underwent liver resection for HCC. All were Child-Pugh Class A or B (15.4% Class B). Median follow-up was 2.4 years (range 10 days to 13.2 years). 61% were male. The average age of patients undergoing resection was 58.6 ± 17.0 years. A stapler was used in 70.7% of those resections, and 62.8% of all resections utilized no other devices. An ultrasonic aspirator was used alone in 11.0% of all cases, and both devices were used in 7.9% of all cases. The crush clamp technique was used without an adjunct device in 18.3%. There were no significant differences in race, gender, or age and stapler use in HCC patients. There were 3 (2.6%) stapler misfires. There were no intraoperative deaths; however, perioperative mortality tended to be higher when the stapler was utilized (4.2% vs. 9.5%, $p = 0.35$). Utilization of the surgical stapler insignificantly decreased mean operative time (263 minutes vs. 240 minutes, $p = 0.15$). Use of a stapling device was associated with an insignificant increase in mean blood loss of 33.5% (381 mL vs. 510 mL, $p = 0.27$), increase in the mean length of stay of 1.6 days (8.0 days vs. 9.6 days, $p = 0.28$), and increase in the intraoperative complication rate (0% to 5.2%, $p = 0.18$). The postoperative complication rate insignificantly increased from 16.3% to 29.3% ($p = 0.12$) with the use of a stapling device.

Conclusion: Interestingly, we found that the use of surgical staplers not only did not improve perioperative outcomes when used for intraparenchymal liver resections in mildly to moderately cirrhotic patients, but there was a trend towards worse outcomes with their use. Although selection bias may play a role in this report, the standard use of surgical staplers for hepatic parenchymal resection in cirrhotic HCC patients cannot be aggressively recommended at this time.

87. OIL FIELD INJURIES: ITS NOT JUST THE PRICE AT THE PUMP

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Background: Our center noted a dramatic increase in traumatic admissions from oil fields coinciding with increasing oil prices. This led to concerns regarding patient demographics, training, or injury mechanisms as causative factors. A review was needed to determine any links to injury that could improve field treatment or prevention.

Methods: Retrospective registry and chart review of patients injured in oil fields that were admitted to an American College of Surgeons verified level one-trauma center from 1/03 through 9/08. Data evaluated included demographics, injury mechanism, injuries, treatment, and patient outcomes.

Results: A rapid increase in admissions were observed with a total of 45 patients injured during the study period. Number of patients injured per year for 2003, 2004, 2005, 2006, 2007, and 2008 were 2, 3, 9, 9, 13, and 9, respectively. Demographically patients were all male, mean age 36 years, neurologically intact (mean GCS=14), normotensive (one patient in shock), and the majority were minimally injured with mean ISS of 9; however, a significant number were critically injured, with 14 patients requiring ICU admission, 4 transfusion, and 6 mechanically ventilated. Machinery injury was the predominant mechanism followed by falling objects, fall, and burns. Only 2 occurrences had inadequate safety measures listed. Injuries were predominantly neurologic 47% (15 brain, 6 spine, 3 combined), extremity 44%, face 13%, pelvic 11%, burn 11%, abdominal 2% and thoracic 2%. The majority were discharged to home (36 patients), 6 to rehabilitation, 1 to a nursing home, and there were 2 deaths (1 sepsis - 1 exsanguination).

Conclusion: Oil field injuries appear to be increasing in incidence. This does not seem to be related to youth or ignoring safety measures. Based on mechanism and injury patterns, lower torso protection, securing overhead material, and fall safety could decrease injury incidence.

88. INCIDENCE, RISK FACTORS, AND CLINICAL OUTCOME OF CONTRAST-INDUCED NEPHROPATHY AMONG

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Background: Contrast-induced nephropathy (CIN) is a well recognized entity. It can lead to an increase in hospital morbidity and mortality. CIN in a trauma population is uncommon and not well described in the literature. The goal of this study is to describe its incidence, risk factors, and the clinical outcome of CIN among the trauma population.

Methods: A retrospective chart review was performed of trauma patients 16 years and older who were admitted to our Level 1 Trauma center during 2005. Patients who received the intravenous contrast study and had serum creatinine recorded at admission, and at least at 48-72 hour were identified. CIN is defined as a rise of serum creatinine 0.5 mg/dl or a 25% increase from the baseline if the baseline is abnormal (>1.2 mg/dl at our institution). We excluded patients that were transferred or had persistent hypotension. Demographics, injury severities score (ISS), and clinical outcome were recorded. CIN and non-CIN variables were compared using Student t-test, Chi-square, and Mann-Whitney test. Multiple logistic regression analyses were performed to identify risk factors for CIN. Statistical significance is considered with p-value < 0.05.

Results: Of 1472 patients, 543 patients fit the inclusive studying criteria. Nineteen patients (3.5%) had CIN. They had higher baseline creatinine (1.48+0.23 vs. 1.06+0.02, p < 0.001), longer ICU-day (17 vs. 5, p < 0.001), and longer hospital stay (19 vs. 8 days, p < 0.001); the mortality was, however, not different (10% vs. 4%, p=0.2). On multiple logistic regression, baseline serum creatinine (OR 1.92, 95% CI 1.13-3.27, p=0.016) was the only significant risk factor for CIN. A series of multiple regressions for each creatinine level was performed and found a cut-off serum creatinine at > 1.1 mg/dl were at increased risk for CIN. All CIN serum creatinine peaked within 48 hour except one patient. All had their serum creatinine returned to the baseline. One patient required a temporary dialysis.

Conclusion: The incidence of CIN among trauma population is 3.5%. Clinical course of CIN is benign. The baseline serum creatinine > 1.1 mg/dl and other recognized risk factors for CIN i.e., diabetes, renal insufficiency, hypotension, repeated intravenous contrast, or rhabdomyolysis may be a ground for a future renal protection strategy study.

89. FEWER TRAFFIC INJURIES OCCUR DURING THE FULL MOON CYCLE

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Fewer traffic injuries occur during the full moon

Background: During a full moon, the evening is brighter than during a new moon. Our hypothesis is that the better illumination during lunation helps prevent traffic accidents.

Methods: The Trauma Registry of our suburban Level 1 Trauma Service was queried for traffic accident victims who arrived during a full moon (plus and minus one day). The volume was compared to the number admitted during new moon, plus and minus one day. Injured patients from automobiles (MVC), motorcycles (MCC), bicycles (BCC), and all terrain vehicles (ATV) were analyzed. Data was gathered from the calendar years 2005 through 2008. A total of 1195 patients were admitted during the study days. An unpaired t-test was used to assess for statistical significance.

Results: In every category of vehicle analyzed, there was higher volume during new moons. The difference was most pronounced for bicycle victims and ATV accidents, and least for automobiles. The comparison between full moon and new moon volume was found to be highly significant (p=0.023).

Conclusion: Many factors affect the admission volume of a trauma center. Weather, season of the year, road conditions, and age of drivers are such factors. It is also known that crashes occur at higher rates per mile driven at night. Our findings found an association of lower traffic victim volume during lunations compared to new moons. Our hypothesis is that the increase in luminosity during lunations, improves night time vision. The improved vision helps reduce the number of crashes.

90. PEDIATRIC ATV TRAUMA: PARENTS SHOULD KNOW BETTER

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Background: Injuries sustained from ATVs are a serious problem in the pediatric population. The purpose of this study is to ascertain regional trends in pediatric trauma associated with ATV use.

Methods: Data on ATV-related trauma admissions from 2003-2007 was prospectively collected and analyzed at our level I trauma center.

Results: Over a four year period, 575 ATV related admissions were identified; of which, 224 victims (40%) were under the age of 16 (mean age of 11.34, and age range of 2-15). Pediatric related ATV trauma comprised 33% of total ATV traumas in 2003 and increased to 50% in 2007. National statistics show an incidence of 31% to 27% during 2003-2007. The overall mortality for ATV traumas was 0.9% during the study period. Of the 5 patients who died during this period, 1 death was in the pediatric age group (0.04%). This mortality was a 13 year old male with massive splenic trauma with hilar disruption, and retroperitoneal hemorrhage. Surgical intervention was required in 66% of pediatric patients. The average LOS was 3.9 days. ICU stay was required in 41% of pediatric patients, with a mean ICU LOS of 2.0 days. The majority (68.3%) of ATV pediatric traumas occurred in children drivers. Helmets were worn by only 39% of victims, but LOS and admission GCS score were independent of helmet status. On admission, GCS<9 was recorded in 6.8% of helmeted pediatric ATV traumas, and 7.9% unhelmeted. A GCS 9-15 was recorded in 93.2% of helmeted pediatric ATV patients and 92.1% unhelmeted. The mean ISS score for pediatric related ATV patients was 10.1; the second highest mean ISS of any MOI seen at our institution behind firearm injuries. Compared to national statistics, our data demonstrates an increasing rate of pediatric ATV injuries, with higher ISS scores, longer LOS, more truncal (23%) and facial injuries (20%) with fewer neurological injuries (25%) than seen nationally. Orthopedic injuries (26%) were less than observed nationally, but 71.3% of these required surgical intervention.

Conclusion: ATV related injuries in pediatric patients are a serious and growing healthcare concern. These injuries appear to be more common regionally, than nationally. Further guidelines and regulations are required to protect our pediatric population. Parents should be educated in risk related to children operating these vehicles.

91. A PARADIGM SHIFT IN MODERN SURGICAL EDUCATION

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Introduction: The American Board of Surgery In-Training Examination (ABSITE) is an annual metric taken by surgery residents and is used to predict pass rates on the surgery qualifying examination in the USA. To fulfill the need for a more structured and modernized surgery education program, our group created a multidisciplinary print and digital review course incorporated within an online learning management system.

Methods: 518 post-graduate years (PGY) 3 and 4 surgery residents were recruited from 2008-2009 from 5 year surgery programs. 96 served as a control group and did not participate in our review program in 2008 or 2009; 225 used traditional resources in 2008 and took part in the clinical review course in 2009; 197 took part in the review course in 2008 and 2009.

Results: Residents in the control group had an insignificant improvement in their percentile ($p>0.05$, $N=68$). PGY-3s that used traditional resources in 2008 and our review program in 2009 improved their score from the 50th to 65th percentile ($p<0.01$, $N=181$, 95% CI -19.06 to -11.70). PGY-3s who started our review course in 2008 and continued it as PGY-4s improved their score from the 66th to the 72nd percentile ($p<0.01$, $N=159$, 95% CI -9.82 to -1.72). PGY-4s who have used our course for two successive years scored higher than those in the other groups ($p<0.01$).

Conclusion: This study indicates that a structured, multidisciplinary review course improves resident performance on objective metrics. Continuing improvement in successive years may offer new synergies when combined with traditional resources. Future directions will monitor scores by residents at all PGY levels, examine changes in patient satisfaction rates, and evaluate performance on the general surgery board examinations.

92. HETEROTOPIC MESENTERIC OSSIFICATION AS A CAUSE OF PERSISTENT ENTEROCUTANEOUS FISTULAE IN A PATIENT WITH A COMPLICATED SURGICAL HISTORY

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Background: Enterocutaneous fistulae are devastating complications of abdominal surgery. One of the rare causes of enterocutaneous fistulae is heterotopic mesenteric ossification following surgical operation.

Pathology: Heterotopic bone formation requires four different factors. These include initial inciting event, release of signals from the site of injury which are sent either by the initially injured cells or by inflammatory cells, mesenchymal cells whose genetic machinery is not fully committed, and activation of the genes that are responsible for forming osteoid and chondroid in those mesenchymal cells.

Methods: We herein present the case of a 59-year-old woman with persistent chronic enterocutaneous fistulae caused by heterotopic mesenteric ossification, a condition which followed a complicated gynecologic laparoscopic oophorectomy, abdominal sepsis, multiple small-bowel resections, and skin grafting for an open abdomen. In addition to describing her case, we review the relevant literature and histopathologic features of this phenomenon.

Results: Overall we found 35 cases reported in the literature. There is only one other report of heterotopic mesenteric ossification associated with enterocutaneous fistula in a woman. Most cases present in males with bowel obstruction after multiple abdominal operations. In our patient, despite her nil per os and total parenteral nutrition (TPN) status and non-operative management, her enterocutaneous fistulae closure was not successful, requiring radical en masse resection of her mesenteric ossification involving a large segment of small and large bowel. Her abdominal wall was reconstructed with AlloDerm™ (LifeCell Corporation, Branchburg, NJ) as a bridge followed by skin graft. Initially the heterotopic mesenteric ossification was misinterpreted as bowel perforation on CT scan. Serum alkaline phosphatase was elevated during bone formation. Two years after her last operation, she is doing well and has not developed a fistula or abdominal wall hernia. She is eating well and is living a normal life.

Conclusion: Heterotopic bone formation should be considered in chronic non-healing enterocutaneous fistulae. The process of heterotopic mesenteric ossification follows a predictable clinical course and can be diagnosed preoperatively. Radical resection is required when associated with obstruction or persistent enterocutaneous fistulae.

93. SCHWANNOMA OF THE SIGMOID COLON: A RARE CAUSE OF SIGMOIDRECTAL INTUSSUSCEPTION

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Background: Schwannomas appear most frequently in the stomach and small intestine. On rare occasions they can be found in the colon or rectum. We report a case of a schwannoma within the distal sigmoid colon that intussuscepted into the rectum and led to a large bowel obstruction.

Case Report: A 25-year-old male presented to the Emergency Department complaining of one-week history of bloody diarrhea and abdominal pain associated with nausea, vomiting, distension, and weight loss. On exam, his abdomen was soft, moderately distended, mildly tender to palpation in the lower quadrants, and without evidence of peritonitis. Laboratory studies were significant for mild electrolyte abnormalities and slight white blood cell count elevation. Abdominal series showed multiple loops of air-filled large and small bowel with air-fluid levels and paucity of air in the distal rectum. Abdominal/pelvic CT scan confirmed these findings and also showed markedly thickened bowel wall in the sigmoid and rectum with secondary inflammatory changes. Rigid proctosigmoidoscopy revealed what was felt to be inflammatory changes in the distal sigmoid colon and rectum without evidence of a mass. He was initially diagnosed with proctosigmoiditis and associated ileus. Nonoperative management was attempted with bowel rest and IV antibiotics.

He underwent a diagnostic colonoscopy for further work up and was found to have an obstructing rectal mass at approximately 9 cm from the anal verge that appeared to be arising from the anterior rectal wall. Multiple biopsies were taken and the pathology revealed colonic mucosa with hemorrhagic necrosis. A repeat abdominal/pelvic CT with rectal contrast showed thickened bowel wall in the rectosigmoid junction with a targetoid pattern suspicious for colonic intussusception. Therefore, the patient underwent an exploratory laparotomy, which showed dilated loops of small and large bowel and a transition point at the rectosigmoid junction. The obstruction was caused by an intussusception of the sigmoid colon into the rectum. Rectosigmoid resection, Hartmann's pouch, and an end colostomy were performed. Ex vivo examination revealed a 4 x 3 x 3 cm hemorrhagic firm mass within the distal sigmoid colon that had intussuscepted into the rectum. Surprisingly, the pathology revealed a sigmoid colon schwannoma.

Conclusion: Schwannomas are part of the family of the gastrointestinal autonomic nerve (GAN) tumors. GAN tumors account for 0.1% of benign tumors of the gastrointestinal tract and are a subgroup of gastrointestinal stromal tumors. To date, there is no other reported case of a schwannoma causing a colocolonic or colorectal intussusception. Patients with such a condition may present with a broad spectrum of nonspecific symptoms. Multimodality investigation is often required and a high index of suspicion is important. Radical excision of colorectal schwannomas with negative margins is the treatment of choice.

94. A CASE OF DISTAL INTESTINAL OBSTRUCTIVE SYNDROME TREATED LAPAROSCOPICALLY

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Background: Distal intestinal obstructive syndrome (DIOS) is the complete or partial obstruction of the colon or terminal ileum by abnormally viscous intestinal contents, and is a common sequel of cystic fibrosis (CF) in adults. Though medical management of this entity is well-described, it is inadequate in some patients, especially those with signs of peritonitis or bowel ischemia. However, surgical options are not widely reported, require laparotomy and sometimes enterotomy, and are complicated by the typically poor medical condition of patients with DIOS. We hypothesized that a minimally-invasive approach to the surgical care of CF patients with DIOS could effectively relieve obstruction refractory to medical management.

Methods: We report the case of a 39 year old woman with CF presenting with nausea, severe abdominal pain, and 48 hours without bowel movement. She was diagnosed with DIOS and unsuccessfully given aggressive medical management. After eight days without any improvement, the decision was made to proceed to laparoscopic exploration and treatment. Additionally, we review the available literature on the medical and surgical treatment of DIOS.

Results: Our patient underwent successful hand-assisted laparoscopic antegrade milking of a 15-centimeter obstructive segment of small-bowel contents into the colon and placement of an appendicostomy tube with drainage. This was followed by postoperative administration of antegrade enemas and nasogastric osmotic cathartics, and the patient had resumption of bowel function. She was discharged to her home. In reviewing the literature on DIOS, the standard treatment is described as aggressive medical management, including nasogastric decompression, hydration, and the administration of cathartics. A dearth of literature was found specifically describing potential surgical interventions, and there were no reported cases of laparoscopic exploration or treatment for DIOS.

Conclusions: This is the first reported case of laparoscopic treatment of DIOS, and it was effective and occurred without postoperative complications. Because of the poor preoperative condition of patients with DIOS and the potential for better tolerance of minimally-invasive surgery, this represents a surgical option which should be considered when aggressive medical management fails.

95. IRRESISTIBLE ATTRACTION: SEQUENTIAL BOWEL PERFORATION CAUSED BY MULTIPLE MAGNET INGESTION

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Background: Ingestion of foreign objects is fairly common among children. Although the Consumer Product Safety Commission has issued warnings to parents regarding the danger of ingested magnets, at least 33 patients were reported to undergo operative exploration for injuries secondary to multi-magnet ingestion in 2007. This patient's delayed presentation underscores the urgency to identify magnet ingestion early and act accordingly in order to prevent perforation and continued bowel injury.

Case: An otherwise healthy 10 year-old girl presented to the emergency department (ED) with a 5 day history of persistent and worsening abdominal pain. She had a prior evaluation in the ED 48 hours earlier with a discharge diagnosis of constipation. On further questioning, parents suggested she may have swallowed small tablet-shaped magnets obtained from her mother's place of employment. On examination, the child was febrile with an abdominal examination consistent with peritonitis. She was tachycardic and normotensive. Laboratory values revealed a leukocytosis. Abdominal radiograph revealed an obvious opacity in the right lower quadrant concerning for location within the cecum. Abdominal/pelvic computed tomography scan confirmed the presence of metallic foreign bodies, consistent with magnets adherent to one another near her cecum. There was also associated free fluid and a pelvic abscess concerning for perforation. Due to the high degree of suspicion of potential complications secondary to magnet ingestion in addition to her acute abdomen, the patient was taken to the operating room for exploratory laparotomy. A large pelvic abscess was drained, and three small bowel perforations as well as a fourth perforation in the cecum were primarily repaired. The magnets were located by palpation in the right colon and were removed via colotomy. The child was treated with bowel rest and IV antibiotics. She resumed bowel function in 72 hours and was tolerating a full diet within 96 hours. She was discharged to home on postoperative day 5 and remained well at 1 month follow-up with no infectious complications.

Conclusions: Magnet ingestion by children is associated with significant morbidity if 2 or more magnets are ingested, or if a metallic object and a magnet are ingested. Early diagnosis with a high index of suspicion is needed in order to intervene surgically or endoscopically and prevent progression to bowel perforation. This case report identifies the need for early surgical consultation and thorough history-taking in patients with abdominal pain found to have a foreign body on radiography.

96. TALC SCLEROSIS FOR TREATMENT OF A CHRONIC AXILLARY LYMPHATIC FISTULA

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Background: Seromas are a known risk of breast and especially axillary surgery with a reported incidence of seromas requiring aspiration ranging from 10%-80%. In general the fluid collection resolves by 4 weeks or after aspiration. In cases of persistent seroma, a lymphatic fistula has been implicated and presents a management challenge.

Methods: Case Report of patient with chronic axillary lymphatic fistula

Results: A 71 year old woman underwent a modified radical mastectomy in May, 2009 for a T2N2MO invasive ductal breast carcinoma. She had two drains placed at the time of surgery which drained 80-100cc/day. Upon removal of the drains she had recurrent axillary seromas which persisted despite multiple aspiration attempts. A month and half after her initial surgery she was taken back to the operating room and underwent a seroma capsule excision and placement of Tisseel in an attempt to resolve persistent drainage. She continued to have output of 60-70cc/day. Subsequently, installation of ethanol into the seroma cavity was attempted without success. After three and a half months of unresolved drainage and delay in her chemotherapy due to fears of infection, the patient presented to our institution for options regarding management of her axillary lymphatic fistula. At this time we decided to attempt talc sclerosis. An incision was made along the lateral portion of her previous mastectomy incision and the seroma cavity opened and explored. It extended into the apex of her axilla without any focal point of drainage. The cavity was dried, and the apex of the axilla was coated with 4g of aerosolized sclerosol talc. The superior portions of the cavity were then closed to minimize dead space, and another 4g of sclerosol talc was instilled in the rest of the cavity. The drain was replaced with a 15 French round Blake drain. A pressure dressing was applied and the patient was discharged home. She removed the pressure dressing 72 hours later. On postoperative day 9 her drainage was 10cc/24 hours. The drain was removed the following week and she started her adjuvant chemotherapy the same week. She had minimal pain from the procedure.

Conclusions: Talc has been used with greater than 90% effectiveness to treat recurrent pleural effusions by inducing an inflammatory response resulting in fibrosis. We employ the same principle to treat a persistent lymphatic fistula following axillary dissection that was not resolved by other management strategies. Seromas are a common problem after breast surgery and lead to increased cost, morbidity, and delayed access to appropriate treatment. Although most seromas eventually resolve with aspiration and drainage, persistent seromas due to an axillary lymphatic fistula remain a management challenge. We present such a case and show that talc sclerosis is a potentially curative procedure that can be performed quickly, safely, and in a cost effective manner in the treatment of these patients.

97. CASE REPORT: PHYLLODES TUMOR IN AN ADOLESCENT

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Background: Phyllodes tumor was first described by Müller in 1838. This disease was formerly known as cystosarcoma phyllodes and historically treated with mastectomy. It is a rare breast disease that accounts for less than 1% of all breast neoplasms and occurs most commonly in females in the 30-50 year old age range. A high index of suspicion in cases of atypical or unusual pathology is necessary to facilitate differentiation. Phyllodes tumors are classified as either benign, borderline, or malignant depending on infiltrative borders, pleomorphism, mitotic rate, and cellularity of the stroma. This tumor is generally classified as breast cancer, as malignant degeneration in recurrences is known to occur in 20% of cases. As phyllodes tumors are insensitive to chemotherapy and radiation, surgery with wide margin excision is the mainstay of treatment in adults. Very few occurrences of phyllodes tumors are reported in females younger than 20 years old. Breast masses in adolescents are generally treated conservatively. Presentation and treatment of adolescent phyllodes tumor is ill-defined due to the limited number of reported cases. A review of the literature follows our case presentation.

Methods: We report the case of a 16 year old patient presenting with a palpable, non-tender breast mass. Initial ultrasound reported that the mass was probably benign. The sonographic measurements were 4.5 x 5.0 x 2.5 cm. An ultrasound-guided True-Cut needle biopsy was advised. Results confirmed a fibroadenoma with stromal fibrosis and follow-up was scheduled for three months. The patient returned in twelve weeks noting that the mass had doubled in size. Lumpectomy was performed. The mass measured 6.5 x 4.5 x 3.0 cm. Initial histologic examination favored fibroadenoma with phyllodes features. Extramural consultation was requested and benign phyllodes tumor was diagnosed. The patient was followed every three months for the next nine months with disease free surveillance. Nearly one year after resection of the tumor, the patient presented with a palpable, non-tender breast mass in the same breast as the primary phyllodes tumor. Mammogram and ultrasound were negative for solid masses or cysts. Four months later, the mass appeared to recede in size. After an additional seven months surveillance the patient appears disease free. She is currently lost to follow up.

Results: A review of the literature will be discussed.

Conclusion: This case illustrates a rare occurrence of phyllodes tumor in an adolescent female. Presentation and treatment of adolescent phyllodes tumor is not established due to the rarity of this disease in this age group. Conversely, presentation and treatment in adults is well established. Breast masses in adolescents are typically treated with conservative measures. However, adolescent phyllodes tumors may be better managed by adaptation of the adult treatment algorithm given the potential for recurrence and malignant degeneration.

98. INCIDENTAL TRICHINOSIS IN THYROIDECTOMY SPECIMEN

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Case report: We report a case of trichinosis in a 43 year old female immigrant from Bosnia, who had thyroidectomy performed for Graves's disease. The patient had evaluation of her Graves disease and opted for surgical management after discussion of her treatment options. She had elective cervical exploration and thyroidectomy performed and had an uneventful post-operative course. Her surgical specimen showed benign thyroid with diffuse hyperplasia but also showed focal encysted larva consistent with a parasitic infestation. There was fibrosis and granulomatous reaction in the adjacent skeletal muscle that was suspicious for trichinella spiralis. The patient's history was reviewed and she indicated that 11 years ago in Bosnia she attended a celebratory meal. They killed and roasted a pig and ate it. After this she and her relatives developed illness with fever, weakness and fatigue that lasted for 2 months. She was hospitalized for a period of 6 weeks. She eventually recovered and was discharged. She has been asymptomatic since then. She was referred to an Infectious disease consultant who reviewed current literature and recommended no antiparasitic therapy. She was not considered infectious since there is no risk of fecal-oral transmission of this disease.

Discussion: Trichinosis or Trichinellosis is a disease caused by ingestion of Trichinella larvae. It has variable clinical manifestations with symptomatic persons exhibiting eosinophilia, fever, myalgia, and periorbital edema. Antiparasitic treatment is only recommended during the acute infection with active symptoms. Laboratory criteria for diagnosis include demonstration of Trichinella larvae in tissue obtained by muscle biopsy, or positive serologic test for Trichinella. Trichinosis is a nationally notifiable disease in the United States. Rare association of trichinosis with squamous cell carcinoma of the larynx and squamous cell carcinoma of the tongue has been reported. A fatal case of trichinosis with intensive invasion and acute massive hemorrhage from a stomach ulcer has been described. Reports of trichinosis in the surgical literature have been reviewed.

99. A RARE MALE BREAST CANCER;INTRACYSTIC PAPILLARY CARCINOMA

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Background: Intracystic papillary carcinoma (IPC) is an extremely rare form of breast cancer representing 0.6% of all breast carcinomas. In males it can range from less than 1% to as high as 7% in some reports. IPC has an excellent prognosis, and typically is seen in older women. We present a case of a male with an intraductal papillary carcinoma of the breast.

Case Report: A 65 year old male was referred with a three week history of a right breast mass that had increased in size and tenderness since its onset. He denied having any recent trauma or nipple discharge. On physical examination the mass was mildly tender to palpation and superficially fixed to the nipple-areolar complex. An ultrasound was obtained revealing a 2 x 2 x 2 cm smooth, firm, cystic mass with internal echoes. The patient opted to forego a biopsy, instead choosing to proceed with a right mastectomy and sentinel lymph node biopsy. The entire nipple-areolar complex was excised including the mass with adequate margins. Pathology revealed a 1.5 x 1.5 x 1 cm cystic mass filled with hemorrhagic substance, and was diagnosed as intracystic papillary carcinoma with adjacent foci of intraductal carcinoma. The mass was found to be estrogen and progesterone receptor positive. The sentinel lymph node was negative for malignancy. The patient did well postoperatively and was referred to oncology where he will begin hormonal therapy.

Discussion: Intracystic papillary carcinoma commonly presents as a benign appearing localized lump located near the nipple. The mean age of diagnosis is 68 years. Mild tenderness, bloody nipple discharge, and pruritus may be associated with IPC. Ultrasound usually demonstrates a cystic lesion with an intracystic solid component. Aspiration of the cyst is often bloody, which can make definitive diagnosis from fine needle aspiration difficult. Some reports suggest core needle biopsy to be more accurate at distinguishing benign from malignant neoplasms. The three subtypes of IPC include pure IPC, IPC with DCIS, and IPC with invasive cancer. They are often hormone receptor positive. Subsequent therapy is controversial, but can be directed by the associated pathology. The reported ten year survival rate is near 100%. Men have lower overall survival rates than women when stratified by stage, but this may be due to higher age distribution among male patients. Intracystic papillary carcinoma is a rare cancer, and can present significant diagnostic and treatment challenges.

100. TRANSGASTRIC ENDOSCOPIC DRAINAGE OF PANCREATIC NECROSIS EQUIVALENT TO SURGICAL DRAINAGE WITHOUT THE USE OF STENTS, DRAINS, OR IRRIGATION CATHETERS

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A simplified approach to treat organized pancreatic necrosis using transgastric endoscopic drainage (TED) is described. This technique provides drainage equivalent to open surgical or laparoscopic approach, without the use of stents, drains or irrigation catheters. A 52 year-old-male was admitted with gall stone induced pancreatitis. He developed necrotizing pancreatitis and multiple organ failure. Four weeks later he deteriorated. A repeat scan revealed a large peripancreatic mass consisting of solid and cystic areas with compression on the body of the stomach. Based on this, TED was planned.

Under general anesthesia, a dual channel endoscope was used. A bulge along the posterior gastric wall was noted. Transgastric entry without any bleeding was obtained with an endoscopic argon coagulator probe. About 1300 ml of dark brown fluid was aspirated through the initial opening. A needle knife and sphincterotome with electrocautery were used to extend the cystogastrostomy. A 4 cm wide opening was established. The endoscope was easily introduced in to the cavity and irrigation was performed. Within 24 hours patient improved. Within a week his renal failure resolved and was off the ventilator in 2 weeks. CT scan a week later showed significant resolution. Nine months later patient remains healthy and therefore, further endoscopy or imaging has not been performed.

Using a simplified technique transgastric endoscopic drainage equivalent to that of open surgical or laparoscopic technique was accomplished. By establishing wider drainage, stents, irrigation catheters and repeat procedures could be avoided making it convenient, cheaper and most importantly, leading to an early recovery.

101. SINGLE INCISION LAPAROSCOPIC SURGERY--CHOLECYSTECTOMY WITH INTRAOPERATIVE CHOLANGIOGRAM

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Background: Single site surgery has become an exciting new area of laparoscopy and a possible staging point to natural orifice endoluminal surgery. Herein describes a patient with prototypical biliary colic attributable to gallstones who desired cholecystectomy. We performed a laparoscopic cholecystectomy with intraoperative cholangiogram through a single 2.5 cm incision.

Methods: A 2.5cm incision was made above the umbilicus, and after veress insufflation, a multiple-port trochar inserted. Through these ports were inserted a 5mm camera, blunt grasper, and high dexterity articulating dissector. The gallbladder infundibulum was elevated and cystic duct dissected until a critical view was obtained. Intraoperative cholangiogram revealed no stones and normal anatomy. Cystic duct and artery were ligated, and gallbladder removed with high dexterity articulating hook cautery. Gallbladder and trochar were removed and fascia closed under direction vision.

Results: Operative time was 2 hours 45 minutes utilizing conventional laparoscope/lens. Estimated blood loss was 5mL. The patient transferred back to spinal cord unit the same day and resumed previous diet and medications. Postoperative analgesics included acetaminophen 650mg for 48 hours and oxycodone 5/325mg once for breakthrough pain. In follow-up, he was doing well with resolution of his symptoms.

Conclusion: Single incision laparoscopic surgery (SILS) cholecystectomy can be performed safely through the use of high dexterity articulating instrumentation and intraoperative cholangiography. A flexible tip laparoscope shortens operative time in our experience. However postoperative advantages of decreased analgesic use and improved cosmesis will ultimately require prospective validation.

102. SINGLE INCISION LAPAROSCOPIC SURGERY (SILS) APPENDECTOMY: SAFETY AND FEASIBILITY IN A COMMUNITY HOSPITAL SETTING

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Single incision laparoscopic Surgery (SILS) has recently emerged as a novel laparoscopic technique aimed at reducing visible scars. The main advantage is cosmetic. Currently, there is no data to suggest that SILS results in faster recovery or less post operative pain. In addition, the safety and feasibility of SILS remain a matter of considerable debate. Visualization and tissue manipulation using SILS are usually more difficult and time consuming. We present the case of a 28 year old female who presented to the emergency department of one of our satellite community hospitals with abdominal pain and was subsequently diagnosed with acute appendicitis. The patient had no history of previous abdominal surgeries. The patient was consented to undergo a SILS appendectomy. An infra-umbilical skin incision was made and a SILS port was placed thru a 1.5 cm longitudinal fascial incision. The mesoappendix was taken down with a harmonic scalpel and the base of the appendix was encircled with 2-0 PDS endoloops and transected with laparoscopic scissors. We did not use any roticulating instruments for this case. The operating room time was 35 minutes. Our video, demonstrates good visualization of the operative field and ease of tissue manipulation using this technique despite the lack of triangulation in our instrument placement. In our opinion, SILS appendectomy is a safe and feasible operation even in small community hospitals. The procedure was performed without compromising visualization or safe tissue manipulation. In addition, no specialized instruments were used.

103. LAPAROSCOPIC DISTAL GASTRECTOMY FOR A GASTROINTESTINAL STROMAL TUMOR

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Introduction: Laparoscopic gastrectomy for gastrointestinal stromal tumor can be technically challenging. This video demonstrates laparoscopic distal gastrectomy with Billroth II reconstruction for a large gastrointestinal stromal tumor.

Methods: A five port approach was utilized. Distal gastrectomy was completed with stapled divisions of the mid-stomach and proximal duodenum. Reconstruction was accomplished via Billroth II gastrojejunostomy. Specimen removal was through an expanded port site.

Results: There were no complications. The post operative swallow study revealed normal function. The patient is doing well two months later.

Conclusion: Laparoscopic distal gastrectomy with Billroth II reconstruction for a gastrointestinal stromal tumor is feasible and safe

104. INTERPOSITIONAL FEMORAL-POPLITEAL VEIN GRAFT FOR TRAUMATIC SUPERIOR MESENTERIC VEIN INJURY

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Traumatic superior mesenteric vein (SMV) injuries are rare but highly lethal. Ligation of the SMV is generally indicated when patients present in hemorrhagic shock. However, in relatively stable patients an attempt to repair the SMV can be justified. Applicable techniques include venorrhaphy, vein patch, resection with end-to-end anastomosis, and interposition grafting. We herein describe the case of a man who survived a near transection of his SMV due to blunt trauma from an assault. He was in class II shock upon arrival. Peritoneal signs were noted on physical exam. A focused abdominal sonogram for trauma (FAST) confirmed a large amount of free fluid in the abdomen. The patient was immediately transported to the operating room.

Exploratory laparotomy revealed massive intra-abdominal hemorrhage. He instantly became hypotensive upon opening the abdomen, which was packed until he became hemodynamically stable. Subsequent exploration identified a laceration of the transverse colon and mesentery extending to its root. Venous bleeding emanated from behind the pancreas. The neck of the pancreas was divided revealing a near complete segmental transection of the SMV. The injury was resected and a primary anastomosis was performed. Several smaller tears were repaired. Splenectomy and right hemicolectomy were carried out for associated injuries.

Despite aggressive resuscitation, acidosis persisted (ph 7.31, base deficit 6.2) and his abdomen became progressively more distended. Second-look laparotomy revealed thrombosis of the SMV due to a strictured repair site. The small intestine was dusky and massively congested. After thrombectomy, the appearance of the bowel improved. The SMV was reconstructed with an interposition vein graft, using a 10 cm segment of the femoral-popliteal vein harvested from the right thigh. This deep vein was chosen because it was a much better caliber match than the great saphenous vein and avoided the use of prosthetic in a contaminated field. The small bowel venous hypertension and congestion improved immediately. The patient made a dramatic recovery; the metabolic acidosis rapidly resolved. His abdomen was closed the next day and he was extubated on postoperative day 2. Bowel function returned in 4 days.

Controversy exists regarding whether traumatic SMV injuries should be repaired. Much like the portal vein, the SMV can often be ligated in a damage control setting. The associated morbidity of SMV ligation is attributed to mesenteric venous hypertension. This patient sequestered an enormous amount of fluid when his primary SMV repair thrombosed. Definitely reconstructing the SMV with a large caliber vein conduit helped resolve his acidosis, lessen his bowel edema, facilitate closure of his abdomen and speeded his overall recovery. In our experience the femoral-popliteal vein is a useful conduit for replacing the SMV. We have used it in both traumatic and oncologic settings.

105. MANAGEMENT OF PEDIATRIC BURNS IN THE IRAQ WAR; LIMITED RESOURCES, ACCEPTABLE OUTCOMES

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Background: In the United States, pediatric burns occur regularly, but are rarely fatal. Most (>70%) are small (< 5% TBSA), and heal with simple dressing changes. Regional burn centers with expertise in burn resuscitation, treatment, and multimodal team support are available for treatment of major (> 20% TBSA) burns. These resources have yielded excellent results and minimal (<5%) mortality. In contrast, with approximately 30 years of continuous militarization and over 15 years of intermittent war, native medical infrastructure in Iraq is disorganized and resource poor. There are currently no burn centers or burn trained surgeons in the country, and minimal treatment options for victims of severe burns exist.

Cases: In 2008, at the United States Air Force Theater Hospital in Balad, Iraq, approximately 80% of the patients received were Iraqi and of those 30% were children. Between 15 September 2008 and 15 January 2009, 12 children (6 months to 12 years old) with severe burns (20-65% TBSA) were treated with 100% survival. All children were eventually able to return to their families (average length of stay 22 days). When severe burns are treated in the austere environment of a military hospital, where emergency medical care, specialist training, and resources are limited, nontraditional options are exploited.

Comparative cases will be presented to illustrate the management options employed for the treatment of severe pediatric burns in austere conditions. This presentation highlights the medical, economic, social, geographic, religious and political challenges encountered in this environment.

Summary: Use of an aggressive team approach, basic burn care, hard work, and conservative grafting strategy led to the successful management of children who otherwise would have died in this resource poor environment.

106. LAPAROSCOPIC-ASSISTED SURGICAL TECHNIQUE FOR THORACOABDOMINAL PENETRATING TRAUMA: A NOVEL APPROACH

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Background: Stable patients with thoracoabdominal penetrating injuries represent a difficult and challenging management dilemma. Laparoscopy and thoracoscopy have now emerged as the most reliable and efficient diagnostic modality. Despite improvements in the technical expertise and laparoscopic capabilities amongst trauma surgeons, conversion to laparotomy for repair of these injuries is still commonly practiced, even for mere evidence of isolated diaphragm injury or hemoperitoneum.

Methods: We present a series of 7 hemodynamically stable patients treated over a 5 year period (2004-9) using a novel approach of laparoscopic-assisted repair of injuries resulting from gunshot or stab wounds. Injuries include those involving the anterior abdominal wall, diaphragm, intercostal vessels, and liver with associated hemoperitoneum and hemothorax.

Technique: Open or Verress needle technique is used to create the pneumoperitoneum. Additional two to three 5 or 10 mm ports are placed appropriately to enable thorough examination of the peritoneum, running the small bowel and examining other abdominal viscera. Based on the location and degree of injury, laparoscopic-assisted repair can be performed. Hemoperitoneum resulting from a liver, spleen, or mesenteric laceration is treated accordingly. Diaphragmatic lacerations are repaired through a small (3-4 cm) incision by extending the existing thoracic stab or tangential gunshot wound.

Results: During the period reviewed, there were 23,687 trauma patients, of which 20,406 were blunt injuries and 2,559 were penetrating injuries. A total of 9,147 underwent operations, of which 1552 underwent laparotomies and 151 underwent laparoscopic exploration. Of patients needing laparoscopic exploration, 7 patients underwent laparoscopic-assisted surgical repair of the anterior abdominal wall, diaphragm, intercostal vessels, and liver. All of our patients were discharged home on the average of 4.4 days (range 1-8 days) without any complications. There were no missed injuries.

Conclusion: We use laparoscopic exploration as our first choice in the management of stable penetrating injuries to the thoracoabdominal and flank area in patients without an obvious indication for laparotomy. The fact that the diaphragm has been injured is not an indication for conversion to laparotomy. Repair of the injury can be performed via a laparoscopic-assisted small incision technique. We suggest that this technique be incorporated into the armamentarium of modern trauma surgeons.

107. TRAUMATIC PAPILLARY MUSCLE RUPTURE AND SEVERE ACUTE MITRAL REGURGITATION: AN UNCOMMON CAUSE OF SHOCK IN THE CRITICALLY INJURED TRAUMA PATIENT

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Introduction: The victim of thoracoabdominal crush injury is vulnerable to many potential causes of hypotension including hemorrhagic shock, spinal shock and cardiogenic shock. Although all of these mechanisms of shock are common in the trauma patient population, the presence of all three mechanisms in one patient presents a less common scenario and is a challenge for diagnosis and management.

Case Report: This case report describes the presentation and management of a 46 year old male with a history of multiple comorbidities and prior abdominal surgeries who sustained a crush injury as the result of being pinned under a one ton bale of hay. This patient suffered traumatic asphyxia and multisystem trauma including spinal cord injury, blunt cardiac injury with papillary muscle rupture and acute mitral valve insufficiency, as well as acute blood loss anemia from multiple rib fractures and soft tissue injuries. This report reviews the clinical assessment of the patient's persistent shock, including the evaluation of hemorrhagic sources, the treatment of neurogenic shock, and the diagnosis and treatment of the complicated blunt cardiac injury which resulted in anterior papillary muscle disruption with acute mitral regurgitation and cardiogenic shock. The latter condition leading to complete cardiovascular decompensation and requiring emergent treatment with an intra aortic balloon pump and mitral valve replacement. The patient's postoperative course was complicated by a delayed rupture of the posterior papillary muscle requiring reoperation for repair. Ultimately the patient recovered sufficiently to tolerate a posterior spinal fusion and was discharged to a long-term acute care facility.

Conclusion: There are many potential sources of shock in the multiply injured blunt trauma patient. The use of twelve lead EKG and troponin during the initial evaluation are very useful negative predictors of significant cardiac injury. However, no such simple algorithm exists to predict the presence of a complicated blunt cardiac injury. Therefore, we propose that when these tests are abnormal and the patient is in shock, even when other potential etiologies are present, an echocardiogram should be performed emergently to evaluate the extent of the cardiac injury.

108. PEDIATRIC INFILTRATING LIPOMA OF THE CHEST WALL: CASE REPORT AND REVIEW OF THE LITERATURE

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Background: Infiltrating lipomas are benign tumors that invade skeletal muscle. They most often occur in fourth through sixth decade within the muscle groups of the shoulder girdle, buttocks, thigh, and groin. They are rare in the pediatric patient, with only nine adequately documented cases in the literature. Only one of those cases involved the chest wall. These tumors are benign, and have not been shown to have a relationship with liposarcoma. Therefore, total excision is unnecessary, and surgical treatment is aimed at removing as much of the tumor while preserving function and limiting morbidity. Excision is often difficult due to the lack of capsule of a typical subcutaneous lipoma, and the tumor frequently has fingers of fatty tissue that extend into multiple muscle groups. Due to these factors, local recurrence and re-operation is common in patients with this tumor. We present a case of a 10 year-old male with a recurrent infiltrating lipoma of the chest wall. The presentation, differential diagnosis, surgical treatment, and prognosis of infiltrating lipomas are discussed.

Method: The medical record of the case was reviewed. Radiographic imaging, intra-operative photographs, and pathology specimens were included in the review.
Results: This Caucasian male presented at age 5 years with a left chest wall mass measuring 28 x 13 centimeters. Due to the size, incisional biopsy was performed. Pathology revealed morphologically normal adipose tissue infiltrating into skeletal muscle consistent with infiltrating lipoma. Cytogenetics was performed on the specimen to rule out low-grade liposarcoma. No chromosomal abnormalities were found. Resection was performed removing the majority of the mass, while preserving functionality of the adjacent muscles. The patient was followed with clinical exams every 6 months. At age 7 years, the anterior component was increasing size and decision was made for re-excision. Pathology was the same as the previous excision. The patient had gradual increase in size of residual component, and decision was made for re-excision when the patient developed mild dyspnea at age 10 years. Surgery removed the majority of the tumor measuring 28x15x5 centimeters and weighing 1515 grams. Total excision would have entailed partial resection of involved serratus anterior muscle, trapezius muscle, paraspinous muscles, and 8th-12th rib. Pathology was the same as previous excisions. The patient recovered with no functional limitations and resolution of dyspnea.

Conclusion: Infiltrating lipomas are benign tumors that most commonly occur in adults and rarely in children. The goal of surgical treatment is to remove as much tumor as possible while preserving function and limiting morbidity. Total excision is unnecessary due to the lack of malignant potential, and can be difficult due to the lack of capsule and local invasion into surrou

109. SEVERE HYPERPARATHYROIDISM AND PANCREATITIS SECONDARY TO DOUBLE ADENOMA WITH ASSOCIATED PARATHYROID CYST

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Background: Of all parathyroid neoplasms, single adenoma occurs in 80% of cases. Double adenomas occur less frequently at approximately 15%, while parathyroid cysts occur in 2%. The combination of these two entities gives this an occurrence of less than 1%. Symptoms are identical to classic parathyroid adenoma manifestations. The presentation of patients with acute pancreatitis secondary to hyperparathyroidism has been described in the literature, which demonstrates resolution of the pancreatitis is possible with resection of the neoplasm.

Methods: A 44 year old man was admitted to the hospital with complaints of acute abdominal pain for two days duration. He denied any recent use of alcohol or any history of previous gall-stones. Laboratory workup revealed acute pancreatitis and a markedly elevated serum calcium level. Radiographic studies showed evidence of acute pancreatitis, no biliary abnormalities, and a left inferior parathyroid adenoma.

Results: Operative resection was undertaken via a standard transverse neck incision. As preoperative imaging had indicated, our dissection was limited to the left neck and yielded what was initially thought to be a large thyroid cyst. After careful exploration, no inferior parathyroid gland was discovered. The cystic cavity was then entered, and within it was found an adherent parathyroid gland and adenoma, which was confirmed after manipulation by use of intraoperative parathyroid hormone monitoring. The thin veiled cyst wall and associated adenoma were then easily resected. Monitoring the described time-points of parathyroid hormone level demonstrated a decline of greater than half, but failed to return to normal. As such, a bilateral exploration was undertaken which yielded a second adenoma of the left superior gland. After resection of this gland and confirmation of grossly normal right sided glands, the parathyroid hormone level fell to within normal. The patient's postoperative course was uneventful and calcium levels remained within normal.

Conclusion: On gross appearance parathyroid adenomas are brownish-yellow well circumscribed masses, while cyst cavities are filled with protein rich thin brown fluid. Though primary parathyroid cancer is rare, specimens should be sent for permanent fixation to rule out malignant transformation. The importance of intraoperative parathyroid hormone monitoring is under-scribed here in this setting of confounding operative findings. Though it has been described that decline of levels to half of manipulation levels are adequate to signify complete resection, clinical judgment prevails in the setting of certain peculiar presentations of disease. Fewer than ten cases of parathyroid adenoma with associated cyst have been reported in the literature, and this finding of a superimposed double adenoma is exceptionally rare. Deliberate dissection and cogent application of current methods of intraoperative monitoring can assist greatly in these rare instances.

110. MALIGNANT MELANOMA ARISING IN PLAQUE-TYPE BENIGN CELLULAR BLUE NEVUS - THE 'MALIGNANT BLUE NEVUS': A CASE REPORT AND LITERATURE REVIEW

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BACKGROUND: Few cases have been reported of malignant melanoma arising in or mimicking benign blue nevi; the limited literature suggests that melanoma arising in benign cellular blue nevi is a rare phenomenon. When diagnosed, it behaves in an aggressive manner and therefore carries a poor prognosis. Plaque-type blue nevi are also a rare phenomenon. Case reports demonstrate that plaque-type blue nevi can develop subcutaneous nodules that can be difficult to distinguish from malignant melanoma. We present a case of two subcutaneous malignant melanoma nodules arising within a plaque-type cellular blue nevus, including surgical treatment and pathology. We will review the pathologic diagnosis, management and prognosis of the so-called "malignant blue nevus".

METHODS: Case report of malignant melanoma arising in benign plaque-type cellular blue nevus.

RESULTS: A 56 y/o female with a history of a plaque-type blue nevus located over her entire upper outer arm noticed two rapidly growing subcutaneous nodules within the confines of the cellular blue nevi. The patient had this lesion since she was 12 years old and had undergone extensive evaluation previously including negative biopsies and MRI. Both subcutaneous lesions were biopsied. The larger lesion demonstrated cellular blue nevi within the dermis and a portion of poorly differentiated melanoma in the subcutaneous tissue. Biopsy of the second lesion revealed cellular blue nevi only. The patient underwent a metastatic work-up which included a PET/CT that was negative for metastases. Due to difficulty in following the patient, we decided to perform an extensive wide local excision including the melanoma and all the cellular blue nevi, with split thickness skin graft closure and sentinel lymph node (SLN) biopsy. Pathology revealed two malignant melanomas each approximately 2 cm in size arising beneath a large multifocal cellular blue nevus. The surgical specimen was also significant for diffuse soft tissue pigmented nodules that extended to the fascia and demonstrated invasion into the muscle (which was pathologically distinct from the melanoma). Surgical margins were negative for melanoma. SLN biopsy was negative for melanoma but demonstrated aggregates of melanin pigment within the SLN and surrounding tissue. Based on these findings, a lymph node dissection was not performed. The patient was referred to medical and radiation oncology to determine which adjuvant therapy to pursue.

CONCLUSION: Melanomas arising in association with blue nevi are extremely rare, and are often referred to as 'malignant blue nevi'. They tend to present at more advanced stages and behave more aggressively than common melanoma variants. Little is known about the optimal treatment however current recommendations are based on treating these lesions in the same manner as other melanoma variants, i.e. according to clinical stage and pathologic prognostic indices. Long-term prognosis is unknown.

111. PRIMARY PANCREATIC NEUROBLASTOMA: AN UNUSUAL TUMOR IN INFANCY

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Background: Pancreatic neuroblastoma (NB) is an uncommon presentation of this neoplasm in infants and children. Widespread availability of diagnostic abdominal imaging along with technological advancements have increased the identification of incidental intra-abdominal masses; malignancy remains a central concern regarding these lesions once they are identified.

Case: We report a case of a fetal intra-abdominal mass discovered antenatally following contrast-enhanced computer tomography (CT) radiography. A 21-year-old woman was referred for CT evaluation at 35 weeks' gestation because of possible acute appendicitis. CT imaging was not conclusive for maternal appendicitis but suggested a fetal pancreatic mass. The baby was delivered by Cesarean section at 36 weeks' gestation due to concerns of fetal distress. Postnatal urine catecholamines were elevated and repeat imaging confirmed a solid lesion in the body of the pancreas with no evidence of metastases. Distal pancreatectomy was performed at seven days of life, and histologic diagnosis revealed NB. Postoperative urine catecholamines normalized and the baby recovered without complications and without the need for any additional therapy.

Conclusion: This case underscores the clinical significance of antenatally detected tumors and early surgical excision of pancreatic masses concerning for malignancy in order to prevent complications related to local invasion or metastatic spread.

112. AORTIC LEFT VENTRICULAR DISRUPTION: A SURGICAL CHALLENGE

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Background: Prosthetic valve endocarditis after aortic valve replacement is an uncommon but greatly feared complication with a reported mortality that ranges from 20% to 80%. This complication has added complexity and risk when the initial aortic valve replacement also includes aortic root replacement or root reconstruction, such as annular enlarging procedures. In these cases the infection can cause annular abscess and finally disruption between the aorta and the left ventricle leading to left ventricular pseudoaneurysm formation. Surgical repair of these typically large pseudoaneurysms is complex, high risk and requires a thoughtful surgical approach to obtain success. In the past year, we have been referred three cases with aortic left ventricular disruption secondary to prosthetic valve endocarditis after previous aortic root reconstruction procedures. We discuss our approach and outcomes to this difficult surgical challenge.

Methods: All patients having cardiac valve surgical procedures at The Methodist DeBakey Heart and Vascular Center from October 1, 2008 to October 1, 2009 were reviewed for cases of prosthetic valve endocarditis in patients with previous aortic valve replacement combined with aortic root reconstruction. Three cases that meet these criteria were identified. Record review was carried out in all cases and follow up by clinic visit or phone call after discharge is 100% complete.

Results: All patients survived surgical repair and complete aortic root excision for complete removal of infected material with reconstruction using a valved conduit and coronary reimplantation. All patients required initial open sternal management of coagulopathy with mediastinal packing and delayed sternal closure with omental flap in two cases. There was no operative mortality and no hospital mortality, and none of the infections have returned.

Conclusion: Aortic left ventricular disruption from endocarditis after aortic valve replacement and aortic root reconstruction can be managed successfully. Our management strategy includes sternal entry with preparations for emergency bypass in case the pseudoaneurysm is inadvertently entered, complete excision of infected material, complete aortic root replacement, initial management with an open sternum to control postoperative bleeding, and closure with omental transposition flap when necessary.

113. A RATIONALE FOR COMPLETE RESECTION OF BARRETT'S MUCOSA DURING ESOPHAGETOMY

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Background: Esophagectomy is standard of care for patients with Barrett's esophagus and at least T1 neoplasia. The outcome of patients who undergo incomplete resection of their Barrett's during esophagectomy is largely unknown. The aim of this study was to describe the outcome of three Ivor Lewis esophagectomy patients who progressed from residual Barrett's metaplasia (which was incompletely resected) to high grade dysplasia (HGD) and were treated with a novel therapy to ablate the lining and avoid re-resection of the esophagus.

Method: A prospective radiofrequency ablation (RFA) database in a single institution was used to select a case series of sequential patients who presented for radiofrequency ablation with residual Barrett's HGN. All patients had previously undergone an Ivor Lewis esophagectomy and had residual Barrett's metaplasia left behind.

Results: Three patients underwent Ivor Lewis esophagectomy and each was left with residual Barrett's metaplasia that with time progressed to HGD. Each patient was treated with consecutive RFA of the esophagus at varying intervals in the postoperative period. Two patients were left with residual disease (HGD) despite circumferential and site-directed RFA. Subsequent therapy involved re-excision esophagectomy with supercharged jejunal interposition in one patient and referral for surgical management in the second. The third patient underwent two consecutive treatments of RFA with complete elimination of HGN and only residual Barrett's remaining.

Conclusion: The current standard of care for patient undergoing esophagectomy is complete resection of all disease, including metaplasia. Thus, patients with a long segment of Barrett's should have a trans-hiatal esophagectomy. As endoscopic therapies improve, RFA is a good initial option for patients presenting with Barrett's dysplasia, which can develop in the residual esophagus. If RFA fails, patients should undergo re-resection of disease to prevent progression.

114. TAMING THE GOOSE: CHALLENGES ASSOCIATED WITH ATYPICAL DEXTROTHORACIC BOERHAAVE'S SYNDROME

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Introduction: Spontaneous esophageal rupture, Boerhaave's syndrome, remains difficult to diagnose leading to delayed intervention. Despite an antecedent history of vomiting or chest pain, only 25% of cases are diagnosed accurately at presentation. We present a rare case of traumatic dextrothoracic Boerhaave's syndrome that posed unusual challenges.

Case report: 54-year alcoholic male presented with vague abdominal and right chest pain after sustaining a fall. Initial trauma work-up revealed a right hydropneumothorax and no clinical evidence of peritonitis. A right chest tube was placed with consequent resolution of the pneumothorax and minimal serous drainage. Subsequently, over the course of the next 24 hours, the chest tube drained 4 liters of serous fluid. The clinical status of the patient progressively deteriorated due to delirium tremens requiring prompt intubation. Air leak was noted on positive pressure ventilation. A CT scan revealed free contrast leak into the right chest and pneumomediastinum around the distal esophagus. An emergent right posterolateral thoracotomy was performed and an intercostal muscle flap was mobilized. Extensive contamination with early empyema and a large perforation on the right antero-lateral aspect of the distal esophagus was identified. The periesophageal tissues were severely inflamed and friable precluding primary surgical repair. The perforation was buttressed with the muscle flap and the pleural space was extensively drained. Gastrostomy and jejunostomy tubes were placed. After an initial stormy postoperative course managed with aggressive ventilatory support, total parenteral nutrition and broad spectrum antibiotic coverage, his clinical condition steadily improved. A month later, barium swallow study revealed a small contained leak into the right pleural space. A retrievable esophageal stent was deployed allowing the granulation to form around the stent. The patient was discharged on clear liquid diet and tube feed supplements and brought back 6 weeks later for stent removal. He is currently doing well and resuming regular oral diet.

Discussion: Right-sided presentation of Boerhaave's syndrome during the setting of blunt trauma is rather infrequent and makes diagnosis even more challenging. Blunt trauma as an etiology of esophageal perforation is rare. The co-occurrence of chest pain and vomiting should strongly raise the suspicion for breach in esophageal integrity. The unusual presentation makes this uncommon diagnosis even more elusive. Once diagnosis of esophageal perforation is entertained, immediate considerations should be given to the following: 1) Non-surgical vs. surgical management 2) Diversion vs. resection 3) Decompression and de-functionalization 4) Primary repair vs. containment vs. drainage 5) Pre-emptive strategy for vascularized flaps 6) Plan for future esophageal reconstruction –retrosternal/Intrathoracic/subcutaneous 7) Possibility for esophageal stenting.

115. GIANT GANGLIONEUROMA OF THE CHEST: SURGICAL CONSIDERATIONS

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Background: Ganglioneuromas are the most common tumors of the sympathetic nervous system. They arise from neural crest cells and are usually well-differentiated and asymptomatic. Their most common location is the posterior mediastinum, but extension into the spinal canal is uncommon. Giant ganglioneuromas in the chest have been reported only rarely in the literature.

Method: A 23 year-old male underwent a CT scan of the chest following a motor vehicle accident, and a large, posterior inferior mediastinal mass was discovered incidentally. The patient declined the strongly recommended thoracotomy at that time for personal reasons. Because of increasingly obvious scoliosis over the next two years and recent onset of progressive shortness of breath, he sought medical consultation. Physical examination revealed decreased breath sounds in the right lung base and marked thoracic scoliosis. Operative intervention was undertaken for diagnosis and treatment.

Results: A right posterolateral thoracotomy was performed with excision of the posterior inferior mediastinal mass. The enormity of the mass required double-entry thoracotomies at the fourth and seventh intercostal spaces via a single skin incision. Intraoperative photographs as well as illustrations will demonstrate the surgical approach to resecting such large posterior mediastinal tumors. The tumor was encapsulated and lobulated with a diameter of 18 cm and weight of 1104 grams. Pathology examination and analysis was consistent with ganglioneuroma. Postoperatively, the patient recovered uneventfully, his symptoms resolved, and an MRI of the chest did not indicate extension of the tumor into the vertebral foramina.

Conclusion: Giant thoracic ganglioneuromas are rare tumors which are usually highly differentiated and can grow rather large insidiously. Despite their large size, they can be resected safely and efficaciously using a double-entry approach.

116. LIVING DONOR LIVER TRANSPLANT IN AN INFANT

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We report the case of an 8-month old male who developed fulminate hepatic necrosis after hepatectomy for hepatoblastoma and required an emergent living donor liver transplant.

The child was diagnosed with a hepatoblastoma involving the right lobe of the liver. The patient had completed 3 cycles of chemotherapy prior to undergoing an extended right hepatectomy. The patient was emergently transported to our center when it was determined that irreversible liver failure had complicated the extensive surgical resection. An ultrasound was performed upon arrival, which demonstrated absence of flow in the portal vein and the inferior vena cava. At the time of transfer the laboratory studies revealed an ALT 107 units (u), AST 182 u/l, an INR of 1.44, and a creatinine of 0.82 mg/dl (normal <0.4 mg/dl for a child of this age). The sodium was 158 mmol/l, and the lactate was 12 mmol/l. The child was massively fluid overloaded and oliguric, and was started on CVVH (dialysis). The patient was resuscitated and then taken emergently to the operating room. The residual left lobe was necrotic, the portal vein was thrombosed, and the inferior vena cava had been ligated and transected. The left lobe of the liver was removed, and the inferior vena cava was reconstructed with an interposition graft using an available iliac vein from a recent cadaveric donor. Flow was re-established through the portal vein using thrombectomy catheters. A porta-caval shunt was created from the reconstituted portal vein to the interposition iliac vein graft in order to decompress flow from the mesenteric circulation. While waiting for a suitable cadaveric donor, the patient's mother was evaluated and found to be a suitable living donor donor. Twenty-four hours after waiting for a cadaveric donor, with the window of opportunity for patient salvage closing for this anhepatic child, the patient's mother underwent a donor left lateral segmentectomy. The segment was then transplanted successfully into the child. At the time of the transplant, the patient also underwent splenectomy for splenic necrosis. The liver function studies on post-transplant day 1 were ALT 954 u/l, AST 1425 u/l, and an INR of 3.3. The creatinine was 0.8 mg/dl. The child was maintained on CVVH until post-transplant day 10. Duplex sonography demonstrated patency of all vessels. By post-transplant day 13, the liver function tests had normalized, the bilirubin was 5.0 mg/dl, and the creatinine was 0.6 mg/dl. Currently the child is doing well. The mother was out of bed and visiting the child in the intensive care unit the morning following surgery. Her post-operative course has been uneventful.

117. OBSCURE GI BLEED DUE TO SMALL INTESTINAL VASCULAR MALFORMATION DEFINITELY DIAGNOSED AND TREATED BY LAPAROSCOPY- A PROPOSAL FOR A NEW DIAGNOSTIC ALGORITHM

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Capsule endoscopy has become a valuable tool in the workup and endoscopic evaluation of intestinal diseases; but it can often miss small bowel lesions. In the face of continued obscure gastrointestinal bleeds, a new standardized algorithm for the surveillance and detection of obscure GI bleeds that encourages the use of helical CT after a negative capsule endoscopy would help decrease the time and cost to diagnosis and treatment.

Case Presentation: A 40 year female was referred to our surgical division for diagnostic laparoscopy and possible small bowel resection for an obscure gastrointestinal bleed. The patient was first noted to have a GI bleed in 1992 and reported intermittent melena since that time. The patient had a normal EGD, small bowel enteroscopy and colonoscopy in 1999 followed by a normal endoscopic ultrasound in 2008 and a normal small bowel enteroscopy again in 2009. In addition to this extensive workup, the patient had three capsule endoscopies that never located the source of bleeding. The patient finally received a nuclear medicine tagged red blood cell scan and helical CT scan in 2009 at our facility which suggested the location of the GI bleed to be in the ileum. With this information, the patient was taken to the operating room for a diagnostic laparoscopy with an exploration of the small bowel, and approximately two feet from the ileocecal valve, a two centimeter mass was noted on the ileum. The area was resected and pathology revealed a benign vascular malformation.

Discussion: Obscure gastrointestinal bleeding (OGIB) is defined as bleeding of an unknown origin that persists or recurs after negative colonoscopy and negative upper endoscopy. This can often present a diagnostic challenge, occurring in approximately five percent of GI bleeds. In 2000, capsule endoscopy was introduced to evaluate the small bowel in its entirety. Several studies show that capsule endoscopy can help reduce the number of possible diagnostic procedures and may be superior to push enteroscopy and small bowel follow-through for diagnosing clinically significant small bowel pathology in patients with OGIB.

The limitation of capsule endoscopy lies in the inability to precisely locate the site of a small bowel lesion due to differences in small bowel transit time and variant anatomy. Additionally, lesions can be missed due to poor bowel preparation or orientation of the camera away from a lesion. Finally, capsule endoscopy should be used cautiously in patients with potentially obstructing lesions and strictures, as well as in patients with dysphagia due to the possibility of capsule retention.

Conclusion: Capsule endoscopy can aide in the early diagnosis of OGIB, however due to inherent limitations, a new standardized screening algorithm should be proposed that recommends a helical CT scan after an initial negative capsule endoscopy to decrease the

cost and time to definitive treatment in patients with continued obscure gastrointestinal bleeding.

118. PANCREATIC MUCORMYCOSIS- A CASE STUDY

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Background: Mucormycosis is a frequently fatal saprophytic fungal infection that has in recent years increased in frequency in immunocompromised patients [1] and those with hematologic malignancies [4]. Patients with uncontrolled diabetes, malignancy, immunosuppression for transplants or from trauma, and those on deferoxamine therapy are at high risk for invasive mycosis [3] presumably due to dysfunctional phagocyte activity[1] in these clinical backdrops. Visceral mucormycosis has also been described occasionally in immunocompetent hosts [5,6,7,8,9]. We present the first reported case of mucormycosis of the pancreas in a 48 year old gentleman with no known risk factors.

Case Report: PN is a 48 year old white gentleman with a 10 year history of daily alcohol use, hypertension, and GERD admitted with a diagnosis of severe pancreatitis. He rapidly descended into sepsis with multi-organ failure and was resuscitated with IVF and started on moxifloxacin and ceftriaxone. The initial abdominal CT showed an edematous and indistinct pancreas surrounded by inflammatory changes. A follow up CT revealed a pseudocyst which was drained by interventional radiology seven weeks after presentation. Cytopathology from the infected pseudocyst was identified as necrotic debris consistent with mucormycosis. The fluid was also positive for *P. aeruginosa* and *B. cepacia*. The patient was treated with broad spectrum antibiotics and Amphoterecin B. He continued to drain necrotic and purulent mixture of fluid from his drain despite CT evidence of interval regression of abscess. Approximately five months after presentation and on 2 months after discovery of *Mucor* the patient underwent extensive surgical debridement of the necrotic pancreatic bed. A postoperative CT scan 20 days after debridement showed continued decrease in abscess size. By postoperative day 38, PN had recovered from sepsis with multi-organ failure and was tolerating an oral diet with minimal abdominal pain. His last abdominal drains were removed, he was ambulating and discharged home.

Conclusion: As previously stated gastrointestinal mucormycosis is a relatively rare phenomenon. Although allusions to pancreatic mucormycosis have been made in the medical literature, no case reports have thus been described. The case above is unique as it is an incidence of documented pancreatic mucormycosis. The case above is dissimilar to most accounts of mucor, as he had no known risk factors for developing the infection. Although the general rule of early detection leading to extensive surgical debridement remains the gold standard of therapy for visceral mucormycosis, our experience suggests that local drainage and management with antifungal flushing may contribute to containment of a necrotic bed until surgical debridement is indicated—certainly this will hold true in patients that may not tolerate surgical debridement due to other comorbidities or circumstances.

119. THE MANAGEMENT OF A COMPLEX ENTEROATMOSPHERIC FISTULA: A CASE REPORT

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The Management of a Complex Enteroatmospheric Fistula: A Case Report

Background: Enteroatmospheric fistulae are extraordinarily challenging wounds to manage, both for the physician and the patient. In this case report, the successful management of a patient's enteroatmospheric fistula is described, and a novel approach to managing these complex wounds is depicted.

Ms. W is a 29 year-old female who underwent transvaginal hysterectomy at an outside hospital. She was transferred to our facility after developing multiple intraabdominal abscesses. She was taken to the operating room emergently for laparotomy and abdominal washout, and her abdomen was left open. Unfortunately, the patient developed a double-barreled enteroatmospheric fistula. After exhausting conventional measures for managing this patient's wound, we used a novel approach that not only provided better control of the fistula output, but also provided a means of closing the patient's wound.

Methods: Conventional methods, including dressing changes as needed, routine vac changes, as well as attempting to isolate the fistula output failed secondary to the extremely high fistula output. The caustic nature of the succus was precluding adequate wound bed healing, therefore the need for control was vital. An open-ended condom catheter was sutured to the perimeter of the double-barreled fistula, surrounding it entirely. Two 10-French nasogastric tubes were threaded down each lumen of the fistula, and an 18-French nasogastric tube was placed just outside the fistula. An air-tight seal was formed around the open end of the condom catheter. Next, the entire wound bed was grafted and covered with a wound vac for five days.

Results: The utilization of the condom catheter allowed for adequate control of the high fistula output. This provided an appropriate time interval for the graft to mature. Prior to this endeavor, the patient was requiring dressing changes or vac repairs daily. By controlling the succus, we kept the wound bed amenable to grafting. The split-thickness skin graft had an 80% take, with the graft failing in the inferior portion of the wound. After the skin graft matured, we were able to place a colostomy bag around the fistula.

Conclusion: Enteroatmospheric fistulae continue to be a burden in surgical patients. They require extensive complex wound management and nutritional support. Control of the fistula is paramount for healing and patient comfort, and is necessary for the time interval needed until the patient is ready for definitive treatment. Controlling fistula output with a condom catheter while simultaneously grafting the patient's wound provided a unique approach that allowed excellent control of the fistula, enabling the patient to begin a regular diet, and discharge from the hospital was expedited.

120. LYMPHOMA DIAGNOSED ON SENTINEL LYMPH NODE BIOPSY FOR SQUAMOUS CELL CARCINOMA

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Background: An association between chronic lymphocytic leukemia (CLL) and cutaneous squamous cell carcinoma (SCC) has been documented. SCC in patients with CLL has been shown to have a more aggressive course. Rarely, metastatic SCC has been documented in nodes infiltrated by malignant CLL cells in patients with clinically apparent lymphadenopathy.

Case: A 63 year old male with a previous history of stage I CLL presented for excision of a posterior auricular biopsy-proven SCC. The lesion was rapidly growing, ulcerated, and measured 3.4 x 1.5 cm. Pre-operatively, sentinel lymph node mapping was undertaken in a standard fashion using radio-labeled sulfa colloid. Intra-operatively, the lesion was found to extend to the sternocleidomastoid fascia. Three lymph nodes were found incidentally in the course of dissection and sent for histological examination. A slightly enlarged sentinel lymph node demonstrating radioactive uptake was found in level III of the right neck. Histology revealed small cell lymphoma. No SCC was identified.

Discussion: No report has been made of CLL found in sentinel lymph node dissection for SCC. There have been rare reports of synchronous involvement of lymph nodes by SCC and CLL, but these have been documented only in clinically apparent nodes. In patients with CLL, sentinel lymph node biopsy for SCC may be indicated. In addition to histological examination for SCC, it must be noted that examination of sentinel lymph nodes for CLL is warranted.

121. SYNCHRONOUS MELANOMA AND CHRONIC LYMPHOCYTIC LYMPHOMA: A CASE REPORT AND LITERATURE REVIEW

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Background: Melanomas greater than 4mm in depth have a high risk of distant metastases with a 40% risk of spreading to regional lymph nodes. Sentinel lymph node biopsy is generally recommended for patients diagnosed with a melanoma that is greater than 1mm in depth, as well as patients with lesions of uncertain metastatic potential. We present a patient who was discovered to have a second primary malignancy, chronic lymphocytic lymphoma, identified on pre-operative lymphoscintigraphy for a primary melanoma.

Case Report: The patient is a 63 year old male who presented with a posterior neck lesion of six month duration, as well as palpable neck lymphadenopathy on physical exam. A shave biopsy was performed that revealed a deeply invasive nodular melanoma (Breslow >4mm, Clark's level IV). A FNA of the enlarged cervical lymph nodes was performed and was negative for malignant cells. A PET/CT scan was completed that revealed multiple enlarged cervical lymph nodes with no other signs of systemic disease. However, there was no increase in metabolic activity of the nodes and they were not thought to represent metastatic melanoma. He was taken to the operating room for a wide local excision of the melanoma and sentinel lymph node mapping with the understanding that any palpable lymph nodes would also be excised. Pre-operative lymphoscintigraphy revealed lymph nodes within the left axilla and right posterior neck. Intra-operatively, lymph nodes in both areas were excised. The lymph nodes clinically appeared to be soft, grossly enlarged, and not consistent with metastatic melanoma. Pathology revealed lymph nodes from the neck and axilla positive for small lymphocytic lymphoma and negative for metastatic melanoma.

Conclusion: The appearance of multiple primary tumors, although rare, is becoming more frequently recognized. An association between melanoma and lymphoid neoplasm was first described 30 years ago. Treatment remains a predicament. Because melanoma rather than the lymphoma presents the greatest threat to overall survival, initial treatment should be directed towards this cancer first. While interferon- α 2b is the preferred adjuvant therapy for melanoma, its effectiveness in lymphoma is yet to be determined.

122. SPLENECTOMY FOR ISOLATED METASTASIS FROM ADENOCYSTIC CANCER OF LARYNX

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BACKGROUND: Adenoid cystic carcinoma (ACC) is a rare, malignant tumor, which usually originates from the minor salivary glands. The laryngeal variant, arising from the glandular components of the larynx, is extremely atypical. Laryngeal ACC is characterized by an indolent course and late pulmonary metastases. Metastasis of salivary ACC to the spleen is an unusual event; there are no reports in the literature of metastasis to the spleen of the laryngeal variant. Splenic metastasis from any cancer is a rare event. When it occurs, splenic metastasis is usually associated with widespread metastatic disease. Splenectomy may be considered for patients with isolated disease, patients needing cytoreduction prior to adjuvant therapy, and for those patients with symptomatic disease.

CASE PRESENTATION: A 26 year-old white male was referred to the surgical service with an enlarging splenic mass and left upper quadrant pain. The pain was described as dull with no exacerbating factors. He had a history of laryngeal adenoid cystic carcinoma that had been treated with total laryngectomy and adjuvant radiation 3 years prior. He initially developed asynchronous pulmonary metastases, which were resected. The patient subsequently presented with a symptomatic, enlarging splenic lesion consistent with metastatic disease. Due to the progression in size of the splenic lesion, its proximity to the capsule with potential complications of rupture or local advancement, and in light of the patient's symptoms the decision was made to proceed with laparoscopic splenectomy.

Pathologic examination showed a 5.2 X 4.3 X 4 cm single metastatic nodule within 0.1 cm from the capsule. The mass shows mucoid areas in the center and microscopically had features characteristic of adenoid cystic carcinoma with a predominant cribriform growth pattern. He had a routine convalescence, and is currently alive and well.

DISCUSSION: The present report is unique in its presentation of laryngeal ACC metastatic to the spleen. Because of the indolent nature of ACC, a splenic lesion might achieve substantial growth, which if left untreated might rupture causing lethal hemorrhage or erode into the adjacent structures (i.e. diaphragm) causing significant symptoms and morbidity. This case illustrates the need to consider splenectomy both for the management of symptoms and also to prevent substantial adverse outcomes that might result from further tumor involvement.

123. PHEOCHROMOCYTOMA AND PARAGANGLIOMA SYNDROME: A MALIGNANT MASQUERADE

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Background: The term pheochromocytoma describes a neuroendocrine tumor of the adrenal medulla, whereas paraganglioma refers to a tumor derived from chromaffin cells outside of the adrenal gland. The most commonly used biochemical test is measurement of 24-hour free catecholamines in the urine. Pheochromocytomas secrete both epinephrine and norepinephrine, unlike paragangliomas, which lack phenylethanolamine-N-methyl transferase and secrete only norepinephrine. Improvements in biotechnology have challenged the “10% rule.” Data show that up to a third of patients have germ-line mutations responsible for a familial syndrome associated with pheochromocytoma. Preoperative evaluation generally includes CT, MRI, and in select cases radiolabeled iodine (MIBG) scintigraphy. Cases of left ventricular thrombus formation and consequent embolization in patients with catecholamine-secreting tumors have been noted in the literature. The cause of thrombus formation in patients with pheochromocytoma has not been established, however, cardiac dysfunction and a hypercoagulable state are likely contributing factors.

Methods: A 26-year-old male with recent-onset diabetes (IDDM), arrived at Denver Health Medical Center for a hypertensive crisis with tachycardia, chest pain, headaches and diaphoresis. He had no family history of neoplastic syndromes. He was found to have a large left ventricular (LV) thrombus and systolic dysfunction with an ejection fraction of 25%. Emboli to bilateral renal arteries and a cerebrovascular accident involving the posterior circulation were a consequence of the LV thrombus. He was placed on systemic anticoagulation with heparin.

Results: A CT-scan of the abdomen revealed a 5.3 cm left adrenal mass. Urine was positive for catecholamines and metanephrines, consistent with a pheochromocytoma. He was placed on alpha and beta-blocker antihypertensive therapy. Subsequently, an MRI showed a suspicious 1.5 cm para-aortic mass. After giving informed consent, the patient was brought to the operating room. A left abdominal approach exposed a hypervascular pheochromocytoma, tightly adherent to the left renal vein. Blood pressure increased during manipulation of the tumor, and then decreased during its removal. Similar blood pressure fluctuation occurred during manipulation and removal of two para-aortic masses. Pathology confirmed that the adrenal mass was a pheochromocytoma, however, the smaller masses near the aorta proved to be paragangliomas. The patient had an uneventful postoperative course, no longer requiring antihypertensive therapy.

Conclusion: When radiographic findings suggest malignant pheochromocytoma, operative sampling is critical to confirm or exclude metastasis.

125. ENDOVASCULAR ABDOMINAL AORTIC ANEURYSM REPAIR USING THE RENAL ARTERY SNORKEL TECHNIQUE

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Introduction: Endovascular abdominal aortic aneurysm repair is now the most common technique performed in the United States and abroad. Current methods of standard endovascular repair require specific anatomic requirements in order for the successful placement of an endovascular stent graft. Patients with aneurysm neck angulation > 60 degrees, severe calcification, or a short aortic neck length are considered to have anatomy which makes stent deployment more difficult. In some cases, an adequate landing zone for the proximal endograft would result in occluding a renal artery. A “snorkel” technique, in which a renal stent is used to preserve renal artery perfusion, can be used to recruit additional aortic neck length in these complex patients.

Case Report: An 88 year old Caucasian male presented with an infrarenal abdominal aortic aneurysm measuring 6cm in maximum diameter. The patient had comorbidities including coronary artery disease, previous lung cancer, chronic renal insufficiency, hypertension, and congestive heart failure. The past surgical history included repair of a right popliteal artery aneurysm and right upper lobectomy. Preoperative CT angiogram revealed the origin of the left renal artery to be juxta-aneurysmal and 1.3 cm below the origin of the right renal artery. However, the origin of the right renal artery had an adequate landing zone for a stent graft, measuring 1.5 cm in length. The procedure was initiated by performing femoral artery cut downs and gaining wire access to the aorta. An abdominal aortogram was then performed. Subsequently, a left brachial artery cut down was performed which facilitated selective catheterization of the left renal artery with a 0.035 super stiff guidewire system. A self expanding, 6mm x 5cm covered stent was placed into the left renal artery. Following stenting of the left renal artery, the main body of the aortic stent graft was inserted and deployed via the femoral vessels. Once deployment of both the main body and renal artery stents were completed, simultaneous balloon expansion of both stents was performed. A completion arteriogram confirmed the absence of a type 1 endoleak. The patient had an uncomplicated post-operative course.

Discussion: Little experience exists with the renal artery snorkel technique for endovascular abdominal aortic aneurysm repair. The use of a fenestrated endograft in the presence of inadequate aortic neck length has been proposed, but this device is not currently available for use in the United States. In this case, the left renal artery stent proved to be a successful alternative to open repair in this elderly patient with a complex aortic neck and multiple comorbidities.

126. URGENT RENAL ARTERY BYPASS CAN RESCUE RENAL FUNCTION DESPITE A PROLONGED ACUTE PERIOD OF ANURIA IN PATIENTS WITH BILATERAL RENAL ARTERY OCCLUSION

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BACKGROUND: The role of renal revascularization for patients with renovascular disease on hemodialysis remains ill-defined. We describe two cases of successful renal artery bypass in patients with underlying bilateral renal artery occlusion who developed acute renal failure and became dialysis-dependent.

METHODS: The first patient was a 54 year-old woman who developed acute renal failure after emergency aortobifemoral bypass surgery. This patient's serum creatinine rose from 1.6 to 5.4 mg/dl over 4 days. She became anuric and hemodialysis was initiated. The second patient was a 62 year-old woman admitted with symptoms of uremia and found to have a large retroperitoneal high-grade sarcoma. Similar to the first patient, this patient's serum creatinine rose from 4.1 on admission to 9.4 mg/dl within 4 days. She also became anuric and was initiated on hemodialysis. Both patients had underlying bilateral renal artery occlusion.

RESULTS: The size of the kidneys of the first patient was normal. In the second patient, the right kidney was smaller than the normal size left kidney. In both patients, we attempted percutaneous revascularization but were not able to cross neither renal artery occlusion. We then performed bilateral renal artery bypass using woven 6 mm Dacron grafts from the limbs of the bifurcated aorto-bifemoral bypass graft, in the first patient, 16 days after her initial surgery. For the second patient, we excised the retroperitoneal sarcoma and placed a woven 8 mm woven Dacron graft from the infrarenal abdominal aorta to the left renal artery. Both patients recovered their renal function post-revascularization and hemodialysis was stopped. Neither patient has needed dialysis at 14- and 2-months, respectively.

CONCLUSIONS: This case report shows that renal salvage is possible with urgent revascularization, even after a prolonged period of anuria in patients with bilateral renal artery occlusion. We postulate that a normal kidney size may be an important predictor for successful renal salvage.

127. ANTEGRADE MESENTERIC BYPASS WITH BIFURCATED GREATER SAPHENOUS VEIN: A FINAL OPTION FOR CHRONIC MESENTERIC ISCHEMIA AFTER FAILED ANGIOPLASTY AND STENTING.

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Introduction: Chronic mesenteric ischemia caused by atherosclerotic occlusive disease is a challenging clinical problem. Despite questions of long term durability, angioplasty and stenting are frequently chosen as initial therapy. When endovascular therapy fails however, open surgical therapy is the last option.

Case: We present a case of a 51-year old female with chronic progressive mesenteric ischemia as result of occlusions of both the CA and the SMA. 10 years prior she underwent angioplasty and stenting of the SMA along with partial bowel resection for acute-on-chronic mesenteric ischemia. The patient was referred to our center after developing recurrent symptoms and failing multiple percutaneous attempts to revascularize her occluded SMA stent. Preoperative evaluation included CT angiography demonstrating diminutive distal target vessels (3-D images). Duplex ultrasound vein mapping demonstrated adequate greater saphenous vein for use as bypass conduit. The presence of a bifurcated GSV graft allowed us to perform an antegrade supraceliac bypass to both the celiac and superior mesenteric arteries with a single inflow anastomosis through an upper midline incision and transabdominal aortic and visceral exposure. (intraoperative images).

Results: The patient recovered without complications and was discharged home in 1 week after the operation. Later she developed an abdominal wound breakdown which was managed on outpatient basis. After 1 month followup, the patients symptoms had resolved, she was gaining weight and CTA demonstrated widely patent grafts (3-D images).