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ABSTRACT

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Developing a trainees' course in the Management of Surgical Emergencies (MSE) for the College of Surgeons of East, Central and Southern Africa (COSECSA).

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Background
In Africa most surgical pathologies present as emergencies and surgical trainees are usually "at the coalface" in managing such patients. A practical six day course on management of surgical emergencies (MSE) was developed to meet the learning needs of trainees in East/Central Africa. Aims were to teach structured thinking processes and practical skills in surgical emergencies and to thoroughly assess participants’ knowledge, technical and non-technical skills.

Methods
Curriculum design was aimed at learners’ needs, as guided by local trainers and previous teaching. Course content focused on emergencies in surgical critical care and trauma, general surgery, orthopaedics, obstetrics and urology; delivered through lectures, tutorials and practical sessions, with individual mentoring. Participants’ knowledge was assessed through end-of-course tests, and practical and non-technical skills evaluated formatively. Opportunity was provided for immediate feedback, and at six months after course completion. Training the trainer courses (TTT) were incorporated into each MSE course. Two centres with wet lab facilities were identified for course delivery, and a local course convenor appointed for each.

Results
Over 3 years experienced tutors helped to run a total of 7 courses in two centres in Lusaka and Nairobi, with course modification according to feedback from course participants and new tutors. Written course material was published as open access and certain course components (e.g. critical care) were delivered independently in other centres. After the 3-year trial period a total of two courses per centre per year are being delivered by COSECSA surgeons, with ongoing TTT. So far >100 trainees and >30 new trainers from 10 COSECSA countries have completed the course in each centre. Over 90% of participants complete the course, and opportunity for further training is provided for those who struggle. Candidates rate course content, delivery and usefulness very highly; for them this is "new" training. Six months later 90% of participants indicate that the course significantly improves their ability to manage surgical emergencies.

Conclusions
An intensive MSE course was effectively developed by a small core faculty for each specialty, and delivered through a widening group of local tutors. Feedback indicated that this course filled a specific learning niche. Effective assessment is based on continuous evaluation during course participation, with good support for those who find it challenging.
Wandering Spleen - 3 subsequent cases in young women

Julie Vaynshte in Be’er Sheva, Israel

Abstract

Background: Wandering spleen (WS) is a rare diagnosis with about 500 cases reported in the literature and is the indication for splenectomy in 0.25% of all cases. In adults it is even less frequent.

Cases presentation: In this series we present 3 consecutive cases of female young adults presented with WS (2 cases of acute onset and one case of chronic onset) occurring in our ward over 6 months period. All 3 cases required splenectomy.

Conclusion: Wandering spleen, although reported as rare, has to be considered in the differential diagnosis of acute or chronic atypical abdominal pain in the young.
**The open abdomen treatment, methods and techniques, our experience.**
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**Key Words**: Open Abdomen, Negative Pressure Wound Treatment, Damage Control Surgery

**Introduction**

Surgical approach to complicated abdominal lesions has taken advantage of the improvement of the technological development of materials and devices. In our retrospective study we have investigated the outcome of negative pressure wound treatment (NPWT) compared to non-negative pressure wound treatment (non-NPWT) used in treating different abdominal conditions requiring open abdomen (OA) approach.

The primary outcome considered was mortality; the secondary outcomes were definitive closer, complications during OA and the need of a second OA after closure.

**Methods**

This retrospective study includes 90 patients (52 male, 38 female) treated with OA during the period (January 2010 - June 2017) in the department of Oncological and Mini-Invasive Surgery, Macchi Hospital in Varese, Italy.

Data analysis included comorbidity, ASA classes, Bjork classes, ICU time stay, days of OA, wound treatment and the use of mesh for definitive closure.

Open abdomen treatment was performed with different tools and techniques such as Bogota Bag, Vacuum Assisted Closure (VAC), ABThera device and when needed vaccum assisted home-made devices), according to recent evidences of WSES1,2.

The first emergency surgical treatment was always follow by ICU stay and second look was performed after every 24-48 hrs (rarely after 72 hrs), toilette of peritoneal cavity was performed and bowl resection was performed a la demand, new laparostomic dressing was done when needed. Definitive abdominal closure was done when the local condition was judged acceptable. Some patients required a second laparostomic treatment for clinical conditions, after closure.

**Results**

Our survival rate was 66,4% while mortality 33,6%, and this was significantly conditioned by comorbidities (p 0,036) and ASA score (0,037).

All patients with no comorbidities survived while survival rate was 63,4% of patients with comorbidities

We considered eight clinical conditions (see Figure 1): mortality in trauma was 30% (3/10) of cases, in peritonitis 46.4% (13/28), pancreatitis 57.1% (4/7), vascular related conditions 20% (3/15), post-surgical infectious disease 16.6%, (1/6), post-surgical peritonitis 21% (4/19), post-surgical ischemia 33.3% (1/3) and post-surgical ACS which was present in 50% (1/2) of all patients.

*Figure 1*
Analysis data showed, as expected, a major mortality in patients classified ASA V and IV respectively 80 and 40% against a 100% of survival in patients classified ASA I. Patients classified ASA II had a mortality of 16.6% while class III 33.3% (see Figure 2). No patient was included in Bjork class 4, in the other classes we have observed a major mortality in class 1B = 42% and minor mortality in classification 3.

Figure 2

The cut-off stay in ICU was decided as 16 days, and was bypassed by 15.5% of all dead patients and 31.1% of these who survived. The abdominal wall closure was performed in 81% of patients (73/90) and data analysis didn’t show any significativity for all variables (comorbidities 0.153, diagnosis 0.117, day of OA 0.597, NPWT 0.166 and NPWT-tecniques 0.118).

The cut-off time before closure was decided as 9 days (laparostomic time): 6 patients with no closure of abdominal wall had maintained the OA for a minimum of 8 days against 21 days of those where we succeeded the closure (see Figure 3).

Figure 3

The NPWT was used 40 patients (44%), 12.5% of these didn’t got definitive closure, we have analysed data divided in two groups, the first group treated with home-made NPWT, and the second one treated with NPWT commercial device. We have observed that all 12 (13.3%) patients treated with the home-made device benefited a definitive closure while 82% of patients treated with the commercial device (23/28) had the same outcome.

Discussion and Conclusion

In our retrospective study only comorbidity and ASA Group were significant for mortality (primary endpoint). Indeed 33.3% (30/90) of death cases had comorbidities on their admission. As in literature, the main indication to AO was peritonitis (31.1% non post-surgical and 21.1% post-surgical) with a mortality of 46.4% (13/28) and 21% (4/19) respectively in the two sub-groups.

The major numbers of patients were classified class IV and had a mortality of 36.4%, while for the exiguity of patients classified ASA V no significant analysis can be considered. The only case that survived in this group was a patient with a diffuse stercoral peritonitis due to sigmoid perforation, severe sepsis, the patient was on chemotherapy for cell T LNH, he maintained the AO only for 2 days with a total hospitalization off 33 days.

In trauma cases 10/90 which represents 11.1% the clinical and prognostic evolution was related with dynamic and the clinical conditions of the victim upon the arrival in the ER. According to the literature patients with acute pancreatitis\(^6\,7\,8\) were the most complex as for operative management and radiological interventional procedures\(^6\). These patients often requested multiple abdominal surgical revision most of them for the removal of necrotic tissues and for the progressive evolution of disease, this requested a long-term treatment and a long hospitalisation\(^6\,7\,8\).

As for the technique in OA this was dependant on the availability or not of the devices, home-made NPWT were necessary if the commercial device was absent, this one for sure was more expensive but with more or less same efficacy.
As for the choice of NPWT or Non-NPWT, in these years we assisted a complete switch in the indications towards NPWT for the multitude advantages that this treatment offers. In this study we observed a radical change in the indications since 2013, before this date OA was performed prevalently using NPWT, and then the choice was directed exclusively on NPWT.

Some aspects of this choice are not yet clear, the surgeon’s personal experience for sure represents an essential discriminating, secondly in trauma, NPWT can raise this risk of bleeding.

For definitive closure, 8 patients (8.9% of the total), all treated with NPWT requested the use of mesh for the definitive closure, in all cases this was a biological mesh, the most used was made with porcine dermis. However the diversity of the clinical conditions and diagnosis of these patients didn’t permit a conclusion on their use. As in literature the use of mesh was necessary in these cases where the abdominal wall defect was wide and skin edges very retracted or where the risk of eventration was very high.

Another more relevant aspect concerning one of the most common complications was the enterocutaneous fistula, extremely variable as percentage (5-75%), depending on different studies. In our study only 5 patients (5.5%) had developed a fistula, 3 of them were treated with a negative pressure. All patients were treated conservatively.

At least, 9 patients required a second OA treatment after the first definitive closure (10%), 4 patients died during the second laparostomy or after its closure. The clinical conditions requiring the second treatment where heterogeneous, abdominal abscess in 3 cases, bleeding in 3 cases, perforation and anastomotic leak in 2 cases, intestinal ischemia in 1 case.

Other considerations can be made on data where the low numbers can’t permit a statistical descriptive study.

Our study is heterogeneous essentially for the clinical conditions of patients requiring OA, despite the fact that the majority of patients required the same treatment have very different physiopathological cause and for this difficult to compare. Individuality of approach is requested in each single patient, each with his own peculiarity and for his characteristic, patients seems to benefit more from NPWT technique that can be adapted on specific needing of each one.

As for results, most important variables to determine the clinical outcome of the patients are linked with the initial clinical conditions of the patient, to his comorbidities and the anaesthesiological risk more than the surgical techniques or techniques of intensive care adopted during hospitalisation.

And even with these points of weakness we can confirm from our study that the open abdomen approach is one of the most safe and effective in DCS in what we can define complicated abdomen, the different methods used depends largely on the experience of the single operator.
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Individuality of approach is requested in each single patient, each with his own peculiarity and for his characteristic, patients seems to benefit more from NPWT technique that can be adapted on specific needing of each one.

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**Bibliography**

and a unifying process is taking place thanks to the digital platform IROA.

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Gastric stump necrosis after subtotal gastrectomy, is it an unusual complication?

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Case report.
Gastric stump necrosis after subtotal gastrectomy is a rare event with few reports in literature.

We report a case of a 74 years old man who was referred to our institution on 18th December 2017 with a diagnosis of pre-pyloric gastric cancer.

Preoperative radiological examinations (CT scan) didn’t show metastatic nodal or hepatic involvement; an endoscopic gastric ultrasonography (EUS) classified the neoplasm as T1 (early gastric cancer), while the esophago-gastric endoscopy reported an ulcerated lesion of 10 mm diameter along the small curve with a biopsy specimen compatible with intramuscular adenocarcinoma.

Known comorbidities were: hypertension, poliartheriopathy, previous surgery (2015) for laryngeal carcinoma, recent weight loss (20 kilograms in 2 years).

On 19th December the patient underwent surgical treatment: partial gastrectomy with Roux-en-Y loop reconstruction, cholecistectomy, omentectomy and D2 lymphadenectomy; the posterior gastric artery arose from the origin of the left gastric artery and was not preserved; left gastro-epiploic artery and vasa brevia were left intact; the splenic artery was patent, as showed by the radiological finding (CT scan).

The histological finding reported: early gastric cancer pT1aN0MxG1.

On third postoperative day the patient developed tachycardia, hypotension (despite fluid resuscitation), obfuscation and abdominal pain. A total body tomography (CT scan) demonstrated plenty of intraperitoneal free air and fluid collections. On 22nd December the patient underwent surgical exploration in emergency: the intraoperative finding was the perforation of the posterior wall of gastric fundus due to the complete necrosis of the remnant stomach and generalized severe purulent peritonitis; anastomotic sutures appeared intact. The gastric stump was removed and a catheter-jejunostomy was prepared by using the Roux-en-Y loop; the aboral end of the oesophagus was closed and the abdominal wall closure was performed by a temporary interposition of Bogota-bag between the bowel and the skin.

After this procedure, the patient was admitted to intensive care unit and on 24th December underwent surgical revision: no fluid collections and ischemic enteric lesions were identified; thus abdominal wall closure with absorbable mesh interposition was performed in order to avoid postoperative intra-abdominal hypertension.

The following postoperative course was characterized by: the appearance of partial skin wound dehiscence treated with VAC therapy; moderate chylous fistula and esophageal stump microfistula treated conservatively. However the general clinical conditions improved and on 19th February the patient was discharged with enteral feeding.
Discussion.
Gastric stump necrosis is a rare critical complication that can be related to anatomical vascular conditions and variations; usually the posterior gastric artery, the inferior phrenic artery and the vasa brevia are involved in the vascular supply of the gastric stump after subtotal gastrectomy. When this surgical procedure is performed for oncological disease, the ligature and section of the left gastric artery at its origin is warranted and usually doesn’t compromise the vascular supply of the remnant stomach. However in polivascularopathy patients this procedure can induce ischemic alterations if it is associated with particular vascular anomalies such as: origin of inferior phrenic artery and posterior gastric artery from the left gastric artery. In this particular patient, the posterior gastric artery arose from the origin of the left gastric artery and it was not preserved. Moreover the pathological finding of the specimen showed trombosis of vasa brevia.

Conclusion.
In polivascularopathy patients, during partial gastrectomy for oncological disease, it could be necessary to preserve the upper branch of the left gastric artery, tying the artery itself after the origin of the posterior gastric artery or phrenic artery if present, without compromising an accurate nodal dissection.
Perioperative use of Non-Steroidal Anti-inflammatory Drugs and Corticosteroids and Anastomotic Leakage in Colorectal Cancer and Inflammatory Bowel Conditions

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Abstract

Objective

To investigate the effect of perioperative administration of non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroids on the development of colorectal anastomotic leakage in colorectal cancer patients and patients with inflammatory bowel conditions.

Design

Systematic review and meta-analysis.

Data sources

Searches of PubMed and Embase without date or language restriction.

Study selection

All studies reporting on the effect of NSAIDs and corticosteroids on anastomotic leakage in colorectal surgery were considered.

Data extraction and analysis

The primary outcome measure was the incidence of anastomotic leakage after colorectal surgery in human patients using NSAIDs or corticosteroids.

Results

We identified thirty-nine papers, 21 on corticosteroids, 18 on non-steroidal anti-inflammatory agents. The pooled incidence of anastomotic leakage in the NSAID cohort for the malignancy subgroup was 9% [95%CI 0.07-0.10 I² 87%], which was significantly higher compared to the mixed subgroup (with benign and malignant disease), in which the incidence was 5% [95%CI 0.03-0.07 I² 82%]. In patients with a malignancy using NSAIDs, the risk on anastomotic leakage was not significantly different from non-users (p=0.20), the relative risk was 1.37 [95%CI 0.84-2.22 I² 87%]. In contrast, NSAIDs did significantly increase anastomotic leak rate in cohorts with benign and malignant disease (p=0.001), the relative risk was 1.73 [95%CI 1.25-2.41 I² 0%].
Corticosteroid steroid usage increases anastomotic leak rate compared to non-users, for all surgical indications, \((p<0.00001 \ I^2 20\%)\). Remarkably, for patients with inflammatory bowel disease the relative risk to develop anastomotic leakage was more than doubled; 2.15 \([95\% CI 1.28-3.62 \ I^2 0\%]\).

**Conclusions**

This review provides systematically analysed literature on the effect of NSAIDs and corticosteroids after colorectal surgery. We demonstrate that the underlying disease affects the impact of NSAIDs and corticosteroids on anastomotic healing after colorectal surgery. If the detrimental effect of NSAIDs is limited to a specific population, subgroups of patients may benefit from this result. Use of NSAIDs could enhance recovery by lowering opioid dosage, which has many gastro-intestinal side effects.
Petersen’s hernia after gastric by-pass procedure: an increasingly frequent condition in emergency surgery

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Introduction: Gastric by-pass is the most frequent surgical procedure for morbid obesity worldwide. Internal hernia (IH) may develop in the Petersen’s space as a consequence of an antecolic Roux-en-Y reconstruction. Symptoms may remain not specific for months before the onset of acute abdomen conditions including mechanical bowel obstruction and intestinal ischemia. Pre-operative diagnosis is mostly based on contrast enhanced abdomen CT scan that shows signs of twisting of superior mesenteric vessels.

Materials and methods: We retrospectively reviewed 9 patients (8 females) with Petersen’s IH referred to our institution between January 2015 and March 2018 for acute abdomen. Mean age was 40.7 yr. All of them had received a gastric by-pass procedure with antecolic Roux-en-Y reconstruction meanly 914 days before the clinical manifestation of IH. The mean weight loss after bariatric surgery was 56.6 Kg.

Results: In all patients the abdominal contrast enhanced CT scan was positive for twisting of superior mesenteric vessels suggesting the diagnosis of Petersen’ IH. The abdominal cavity was explored laparoscopically with identification of the IH. The herniated loop was gently relieved from the Petersen’ space, the blood supply of the bowel loop was assessed, and the defect was closed with a non-adsorbable interrupted suture. Conversion to open surgery was required in one patient. The course of the patients was uneventful. At follow-up no recurrence was observed.

Discussion and conclusions: A high degree of suspicion for Petersen’s IH should be maintained in patients after gastric by-pass surgery with antecolic Roux-en-Y reconstruction. In these patients, an unexplained persistent abdominal pain should be investigated by contrast enhanced CT scan. The laparoscopic approach is safe and effective and it allows to relieve the herniated bowel loop and to close the mesenteric defect.
Purpose: to improve the results of treatment of patients with acute cholangitis in a multi-field contemporary emergency hospital. Over the past 15 years, the incidence of purulent cholangitis has been steadily increasing. The main cause leading to mechanical jaundice and cholangitis is choledocholithiasis (up to 86.2%). According to dates of various authors, treatment of this category of patients is accompanied by a high rate of complications (up to 54.1%) and high mortality (4.7-28.5%). The results of treatment of 223 patients with acute cholangitis who were admitted to the St. Petersburg Research Institute of emergency medicine in 2012-2017 were analyzed. 176 (96.0%) of patients were received on urgent indications. The men were 98 (43.9%), women -125 (56.1%). According to the Tokyo guidelines (2007, 2013), 3 groups of patients with cholangitis were distinguished: grade 1 (mild), grade 2 (moderate) and grade 3 (severe). Patients with mild cholangitis were 53 (23.8%), moderate -116 (52.0%), severe -54 (24.2%). Most patients (n = 169, 75.8%) were treated with acute cholangitis caused by benign causes. Acute cholangitis of malignant etiology was diagnosed only in 54 (24.2%) patients. The main cause of cholangitis was choledocholithiasis (N = 163, 73.1%). The mean age of patients was 70.8 ± 14.6 years (2093 years). At the same time, more than 70% of patients were over the age of 60 years.

Two-stage tactics of surgical treatment was used: urgent biliary decompression, then delayed elimination of the cause of cholangitis. At the same time, we managed to ensure that 79.3% of patients with moderate severity cholangitis were drained in the time frame up to 12 hours and 72.4% of patients with severe cholangitis underwent decompressive intervention earlier than 6 hours from admission to the hospital. During primary biliary drainage priority was given to the antegrade methods in case of obvious malignant cholangitis and if the cause of biliary obstruction was not diagnosed in the primary tests. 109 percutaneous transhepatic interventions, 63 draining endoscopic operations were performed as a first step of surgery. Manipulation of 2 stages was performed in 76.1% of patients with benign cholangitis and in 68.3% with cholangitis of malignant etiology. 24 hybrid operations were performed. As a result of using the principles of patient routing and two-stage tactics of their treatment, the incidence of complications decreased from 36.4% to 20.5%, and hospital mortality fell from 21.6% to 11.4%. P<0.05 Thus, the differentiated tactics of two-stage surgical treatment of patients with acute cholangitis, based on an objective assessment of the severity of cholangitis, compliance with the timing of decompression, as well as reasonable routing of patients, allows to reduce the mortality and frequency of complications in this category in the emergency hospital. However, it is obvious that the problem of treating patients with acute cholangitis is far from being solved. Further analysis and scientific search for approaches to the diagnosis and treatment of acute cholangitis is required.
Title: Elevated Alkaline phosphatase is the best single predictor for bile duct stones

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Abstract

Introduction

Biliary lithiasis is common in most western countries. Symptomatic patients will also have choledocholithiasis in 10% of the cases. For patients with intermediate probability of CBD stones, the recommended imaging studies are endoscopic ultrasound (EUS) or MRCP. In our research we have sought to establish early factors that can be used as predictors for the presence of CBD stones, and by that to identify which patients should undergo ERCP without an early EUS.

Methods

This is a retrospective cohort study that includes all patients who underwent EUS for suspected choledocholithiasis at Soroka University Medical Center (SUMC) between the years 2009-2014. Data collection was performed by manual surveillance of patients computerized files. Data gathering started after approval by the Soroka Institutional Review Board.

Results

One hundred seventy-five (175) patients participated in the study. The average age was 57, and 111 patients were women (64.2%). Sixty-two patients (35%) were found positive for common bile duct stones by EUS and underwent an ERCP. Eighty-two percent of those patients were found to have CBD stones at ERCP. Patients found positive for CBD stones by EUS were older than those who were negative (52 vs. 71 respectively, p<0.001). These patients were also found to have a higher prevalence of ischemic heart disease and congestive heart failure. Common bile duct dilatation ≥8mm and gallstones presence in abdominal ultrasonography were more
common in patients found positive for CBD stones by EUS than in those who were found negative (45% vs. 24% p <0.05, and 81% vs. 66% p <0.05, respectively). Alkaline Phosphatase (ALP) serum levels higher than 300 IU/L were found to be the only independent predictor for the existence of CBD stones (OR=2.98, p = 0.001). When ALP serum levels lower than 150 IU/L or GGT lower than 150 IU/L were measured, the probability of having CBD stones was low (NPV of 90% and 87%, respectively).

**Conclusion**

ALP serum levels higher than 300 IU/L are an independent predictor for the presence of CBD stones. EUS is an excellent screening tool for choledocholithiasis before performing ERCP. In most patients who undergo an early EUS, a subsequent ERCP will not be needed.
How valid is the use of Alvarado score, in the assessment of treatment tactics in Acute Appendicitis?

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Abstract

Background: Despite advances in diagnostic technology, appendicitis remains a Surgical Emergency. In the Emergency Department (ED), the largest assessment of patients with abdominal etiology and clinical abnormalities is performed. Some researchers have created diagnostic evaluation systems for it, is defined as precisely with the presence of acute appendicitis. The best known of these predictive systems is the Alvarado Score. The purpose of this study is to evaluate the diagnostic accuracy of the Alvarado Score as a tool for predicting acute appendicitis.

Materials and methods: This is a retrospective study which involves 100 patients of surgery service at University Hospital Centre “Mother Teresa”, Tirana, Albania. All the patients were hospitalized for acute appendicitis during May - June 2017 time frame and they have been subject to surgical intervention.

Results: 20 patients were evaluated with 5-6 Alvarado points, 58 of them had 7-8 points and the remaining 22 patients had 9-10 points. None of the patients had below 5 Alvarado points. 80% of patients had more than 7 Alvarado points.

Conclusion: Alvarado scoring system is still a very valuable tool in the diagnosis of acute appendicitis especially in the setting of emergency departments where the 5 points cut-offs can be used to differentiate the patients who need surgical consultation from ones who don’t. 7 points of Alvarado can’t be used as a tool alone to select patients who will undergo surgery due to its 80% sensitivity.

Keywords: appendicitis, Alvarado, diagnosis, acute abdomen
An observational review of the impact Quality Improvement interventions in emergency Laparotomy in the UK

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Background

In 2012 a UK national audit on outcomes in emergency Laparotomy in the UK revealed a huge variation in mortality between hospital trusts nationwide, with a range from 12%-40%. This prompted comparison with an equivalent population (New York City) that showed a mortality of 8% from the same procedure. As a consequence a number of quality improvement (QI) projects were started in order to try and improve outcomes and reduce variation.

This is an observational review of how QI was used to make changes to care in emergency Laparotomy and it’s impact on mortality and length of stay.

Method

4 interventions were identified that have used QI as a means of improving outcomes in emergency laparotomy: ELPQuIC, EPOCH, the NELA database and the Emergency Laparotomy Collaborative.

Results

EPOCH recruited 190 hospitals delivering QI teaching to each in a random clustered model of inclusion, but has not finished reporting outcomes. The first and smallest study (ELPQuIC) reduced mortality significantly. It was then part of a scaling up project called the Emergency Laparotomy Collaborative from 4- 26 hospitals across 3 regions. 30 day crude mortality fell from baseline 10.6% to 7.3% at 18 months and length of stay reduced from 21.2 days to 15.4 days. At the same time the NELA database (14 regions) showed a national crude 30 day mortality of 10.3%.

Conclusion

Setting up a National database for emergency Laparotomy has enabled the conduct of large QI projects on emergency Laparotomy care and gathered a nationwide picture of resource and capacity availability in emergency surgical care over 190 acute hospital trusts in England. It has enabled a big picture overview of how NHS resources are used in emergency surgical care; showed improvements in outcome by teaching and using QI initiatives and creates scope for further projects in QI tools across emergency surgery.
Complicated Metastatic Colorectal Cancer
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Abstract

BACKGROUND:
Colorectal Cancer/CRC/ is third most common cancer in the world and the second in Europe. Alongside with the advancing medical technologies, we register higher levels of 5year survival. The main decisive factor in CRC prognosis are liver metastases. Independent of improved image diagnostic methods and screening programs, almost in 1/3 of cases with CRC there is different form of complication, requiring often emergency treatment. Most common is bowel obstruction, followed by perforated and bleeding cancer. The metastasized CRC with signs of emergency is a challenging issue.

METHOD
This is a retrospective study of all CRC patients with liver metastases/MCRC/, treated between June 2012 and December 2017 in the surgical departments of university hospitals Eurohospital and St George, Plovdiv, Bulgaria. Patient assessment was done by the following criteria ASA score, gender, age, type of complication of metastatic CRC, laparoscopic or conventional operation performed.

RESULTS
There have been 286 colorectal operations performed for complicated metastatic CRC in this period, 185 of which for bowel obstruction. Left colon and rectum were engaged in 138 patients. Right colon obstruction did appear in 41 patients, transverse colon - in 6. Laparoscopic operations were performed on 31 patients, conversion – in 5 cases. Perforated CRC with liver metastases were found in 69 patients, 61 of whom on the left and 8 on the right colon. Diagnostic laparoscopy was done on 41 patients, where in 29 of them it continued as a therapeutic one. Tumor bleeding, where conservative treatment failed was registered in 32 patients /27 on the right and 5 on the left colon respectively/, where laparoscopic operation was done in 27 cases. Mean patient age was 67(range 49 to 82). All patients did have ASA score above I. Mean hospital stay was 10,3 days for obstructive MCRC; 11,2 days for perforated MCRC and 7 days for bleeding MCRC. Hemo-transfussion was needed in 26 cases (14,1%). In 24 patients with perforated MCRC open abdomen treatment was indicated with planned relaparotomy and VAC therapy in 9 cases. Emergency reoperations /including on demand relaparotomy/ were performed on 12 patients (6,5%). In 9 cases on going peritonitis was found, in 3 cases – insufficiency of the distal stump. Total complication rate was 9,1%/26 patients/; wound infection – 19 patients, wound dehiscence – 2 cases. Lethality was 4,9% / n=9/ in patients with obstructive MCRC and 11,6%/n=8/ in patients with perforated MCRC.

CONCLUSIONS
Complicated cases of MCRC have considerable morbidity and mortality. Early diagnosis is a key prerequisite for better perioperative results. Although generally aiming at one stage operations, in these kind of patients, we are often forced to perform two or even three stage operations. Leading criteria are general patient’s condition, extent of peritoneal infection and risk of anastomosis failure. Laparoscopic operations have their place in this kind of pathology, mainly lowering the operative risk, morbidity and mortality.
Hartmann’s Procedure in Emergency Surgery
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Abstract

BACKGROUND
The emergency complicated diseases of the left colon often require the Hartmann’s procedure. Proposed back in the early 1923 by the French surgeon Hartmann, it is still a safe exit in critical cases. It is generally indicated in all conditions, where primary anastomosis is not sound or at a high risk. These are emergencies like advanced complicated left colon cancer, diverticulitis, sigma volvulus, acute mesenteric ischemia, necrotizing colitis as well as traumatic and iatrogenic injuries and all cases of anastomosis take down. The increasing rate of mini-invasive procedures worldwide show successive outcomes of laparoscopic Hartmann’s procedures.

METHOD
In this retrospective study we analyzed all patients with Hartmann’s procedures performed emergently between June 2012 and December 2017 in the surgical departments of university hospitals Eurohospital and St George, Plovdiv, Bulgaria. Basic indices for assessment have been ASA score, gender, age, type of disease, laparoscopic or conventional obstructive Hartmann’s resection.

RESULTS
From a total of 1974 colorectal operations, the emergency Hartmann’s procedures turned out to be 168, 47 of which /28%/ laparoscopic. Conversions were 6/12.8%/ . The etiological distribution was as follows: advanced and complicated left colon cancers - n-128 (76,2%); complicated diverticulitis - n-13 (7,7%); anastomosis insufficiencies- n-27 (16,1%). The average age of patients was 66,7(range 52 to 89). All were ASA above I. Middle operative time was 138 min for conventional and 165 min for the laparoscopic operations. Mean hospital stay was 9,2 days for open and 7,1 days for the laparoscopic ones. Haemo-transfusion was needed in 29 cases. Complications appeared in 23 patients (13,7%). The most common were wound infections- n-21. Reoperations for anastomosis insufficiency have been performed in 16 patients. In 6 of them the insufficiency was on the distal stump, while in the rest 10 there was on going peritonitis. Open abdomen treatment required 21 patients. Lethality was 10,7%/18 patients/.

CONCLUSIONS
The Hartmann’s operation remains a gold standard in all complicated cases of emergency operations of the left colon. In patients with severe performance status, these operations have lower rate of perioperative complications. The reported morbidity and mortality levels are acceptable. In a high percentage of the stoma cases, they can remain permanent ones. Laparoscopic techniques are more preferred, mainly due to the better outcomes. Currently they are safe and effective alternative to the conventional Hartmann’s procedure.
Introduction

The spleen, a secondary lymphoid organ, is the organ the most frequently affected by closed abdominal trauma. In less than 15% of cases, the patient is admitted in a state of hemorrhagic shock and requires immediate surgery with, in most cases, splenectomy for hemostasis. The early and late complications of splenectomy justify that in the 85% of patients who are hemodynamically stable on arrival non-surgical treatment is recommended because it allows the best splenic rescue rate. Due to the need for secondary splenectomy, the rate of spleen rescue in trauma patients has increased from 60% to 80% thanks to splenic arterial embolization (SAE). The currently accepted indication for SAE is the presence of an active CT contrast agent leakage and the appearance of post-traumatic splenic pseudoaneurysms or FAVs that are responsible for most secondary splenectomies due to physiological intra-splenic hyperpressure. In view of the efficacy of EAS and its capacity to preserve the spleen’s immunological functions its indication has been extended, in a variable manner depending on the center, to patients who present two other factors predicting secondary splenic hemorrhage identified in retrospective series: (i) very severe splenic damage (Moore grades 4 and 5), (ii) severe...
splenic damage (Moore grade 3) associated with a large hemoperitoneum and/or the presence of associated extra-digestive lesions.

**Study objectives and methods**

The purpose of this prospective multicenter randomized study was to evaluate the risk-benefit of the practice of preventive splenic embolization (embolization group) versus surveillance (surveillance group) in hemodynamically stable adult patients with a severe splenic trauma at high risk of splenectomy within the last 48 hours, according to the following criteria: either very severe splenic damage (Moore grades 4 and 5), or severe splenic damage (Moore grade 3) associated with a large hemoperitoneum and/or presence of associated lesions (NISS score - New Injury Severity Score ≥15). The main objective of this study was to show that preventive embolization improves the rate of spleen rescue at 1 month. The primary endpoint was an immunocompetent spleen, i.e. intact or treated by procedures that allowed preservation of at least 50% of the vascularized splenic tissue in secondary laparotomy, or with necrosis of less than 50% in volume in cases of non-surgical treatment. The complications of embolization, the spleen rescue rate at 6 months, and the medico-economic implications of both approaches were studied. The Moore grade at inclusion and primary endpoint were validated by masked reading of all scans taken at D0 and D30 by a panel of two senior radiologists.

**Results**

A hundred-forty patients were included in the study and randomized, 18 patients were subsequently excluded due to absence of a CT scan at D30. The analysis focused on 122 patients, 94 men (77%) and 28 women (23%) with an average age of 35 years 7 months (min 18 years, max 74 years).

Sixty patients were randomized to the "embolization" group, 49 men: (81.6%) and 11 women: 11 (18.4%) with an average NISS score of 20.5 [9-43]. Two early splenic complications occurred (3.3%): a minimal active leak observed by CT on D6 with re-embolization on D10 and localized splenic infarction. For one patient the D30 scan revealed a splenic arterio-venous fistula; which was embolized. In this group there was a total of 2 secondary re-embolizations (3.3%) and no splenectomy. The spleen rescue rate at 30 days was 95% (with 3 parenchymal vascularizations of <50%).

62 patients were randomized to the "surveillance" group, 45 men: (72.6%) and 17 women: 11 (17.4%) with an average NISS score of 21.3 [9-48]. Fifteen early spleen complications occurred (24.2%): 7 pseudoaneurysms, 3 active CT contrast agent leaks, 2 splenic arterio-venous fistulas (with indication for embolization for all 12 cases); 2 splenectomies and a case of splenic infarction. At D30, the CT scans revealed pseudo-aneurysms in 2 patients who underwent embolization. In this group there was a total of 14 secondary embolizations (22.6%) and 2 splenectomies (3.2%). The 30-day spleen rescue rate was 93.5% (2 parenchymal vasculariations (<50%) and 2 splenectomies).

**Conclusions**

This study shows that patients with severe splenic damage of Moore grade 4 or 5, or grade 3 damage with aggravating factors (abundant peritoneal effusion and/or associated lesions) have a rate of occurrence of intra-splenic vascular lesions and secondary rupture of 25% in the control, surveillance only, group versus 3.3% in the early embolization group. Systematic CT monitoring on D0, D5 and D30 allows these vascular events be detected and a rate of splenic rescue of greater than 93% in both groups.
Taking the Road Less Traveled: Emergency Laparoscopic Repair of Incarcerated Ventral Hernia

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BACKGROUND
So far, the role of laparoscopy for the repair of incarcerated/strangulated ventral hernia remains uncertain. Data from a few case series suggest that, compared to elective laparoscopic repair, a laparoscopic approach to acutely complicated ventral hernias is not associated with an increasing rate of postoperative complications and/or hernia recurrence. In addition, the potential detrimental effect on the laparoscopic procedure given by the concomitant small bowel obstruction (SBO) has not been addressed yet. Finally, laparoscopic emergency hernia repair may represent a tremendous challenge for the surgeon that, in a safe and effective manner, should be able to perform adhesiolysis, to relieve the herniated bowel into the peritoneal cavity and to repair the wall defect in the presence of distended bowel loops.

METHODS
By a review of an institutional hernia database prospectively maintained since 2015, 32 patients (27 F; 5 M, mean age: 66 yrs, mean BMI: 29.5 Kg/m²) which underwent to laparoscopy surgery for acute complications of ventral hernia were identified and analyzed. All of these were referred for abdominal pain associated with the evidence of an incarcerated anterior abdominal wall hernia. After initial resuscitation, diagnostic imaging studies (including plain X-ray film of the abdomen, abdominal US scan and abdominal CT scan) were obtained. As emergency surgery was warranted, a careful selection of patients suitable for a laparoscopic approach was made. The decision-making process included the degree of the SBO, the size and the location of the hernia defect, the defect/hernia sac ratio, and the on-call surgeon’s laparoscopic skill. Conversion to open surgery, length of the procedure, length of postoperative stay, postoperative morbidity, and hernia recurrence were the main outcome measures of the study.

RESULTS
At laparoscopy, 15 out 32 patients (47%) had an incarcerated bowel within the defect with signs of SBO. In the remaining 17 cases, the content of the hernia sac was omentum. The procedure was completed laparoscopically in 30 patients (94%). Once the herniated bowel loop/omentum had been repositioned in the peritoneal cavity, the hernia defect was repaired by the placement of an intra-peritoneal composite mesh. The mean size of the width and the length of defect through which incarceration occurred were respectively 3.2 and 4.6 cm. Before the placement of the mesh, the hernia defect was closed by non-absorbable interrupted sutures in 24 cases (75%). Conversion to open surgery was required in two cases only (6%), and it was due to the need to resect a nonviable bowel loop (one patient) and for dense adhesions (one patient). The mean operative time was 133 min. (range 75-250). Partial thickness small bowel tear occurred in one patient (3%) and it was repaired laparoscopically. In the course, one patient (3%) suffered from a prolonged ileus that was managed conservatively. Mean hospital stay was 2.9 days (range 1-8). After
discharge, 3 patients (9%) developed a clinical seroma that resolved with conservative management. At a mean follow-up of 19 months, there have been no recurrences.

**CONCLUSIONS**

Results from this series show that in carefully selected cases a laparoscopic approach to incarcerated ventral hernia is safe and effective. Keeping an uncontaminated abdomen and respecting for the rules of minimally invasive elective repair are the keys for a safe laparoscopic mesh repair and a successful outcome.
Infantile Hypertrophic Pyloric Stenosis: 20-years experience at University Hospital

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ABSTRACT

INTRODUCTION: Infantile Hypertrophic Pyloric Stenosis (IHPS) is the main surgical condition producing emesis in the first month of life. Its diagnosis is based on clinical and laboratorial findings, with the ultrasound (US) as the complementary exam of choice. Recent data claimed that the traditional presentation has been changed, due to earlier diagnoses and treatment. OBJECTIVES: To compare epidemiological, clinical and laboratory aspects of patients with IHPS admitted in the last 20 years in a University Hospital. MATERIAL AND METHODS: A retrospective cohort study with a survey of patients seen between January 1997 and January 2017 at the Hospital das Clínicas of Unicamp, with diagnosis of IHPS submitted to pilorotomy. Patients were separated into 2 groups: G1 (1997-2007) and G2 (2008-2017). RESULTS: 48 patients were evaluated, 79.2% were boys and 57.8% were firstborn. The mean age of diagnosis was 43 days, with 16.9 days between the onset of symptoms and final diagnosis. Dehydration was the main clinical symptom (84.4%) and pyloric olive was palpable in 12.5%. There was no statistical significance difference for clinical variables between G1 and G2. Significant lower serum sodium levels were observed in G1 patients (132.5 vs 136 mmol / L, p = 0.0426). Univariate analysis did not reveal risk factors related to prolonged hospitalization. CONCLUSION: Differences were observed only in the serum sodium value, with an elevated level in G2, most likely secondary to the aggressive intravenous fluid prior to the final diagnosis. No other changes in clinical or laboratory variables were observed. Despite the easier access to health services and availability of imaging exams on the last decade, there were no changes in age or time to diagnosis. It is essential that general pediatricians are trained to promptly recognize IHPS as a possible diagnosis when facing a young infant with non-bilious vomiting associated with characteristic laboratory abnormalities.
Safety of Laparoscopic Emergency procedure in the elderly: an interim analysis of preliminary data of FRAILESEL study

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Presenter: Fransvea Pietro MD

Introduction: life expectancies are increasing and consequently there is an increasing elderly population with more complex co-morbidity. Emergency surgery in the elderly is challenging in terms of decision making, managing co-morbidity and post-operative rehabilitation with high morbidity and mortality rate. New physiopathology acknowledgement, improved surgical and anesthetic skills allowed the surgeon to achieve better results in treating these high risk patients. The aim of the present study is to evaluate the feasibility and safety of laparoscopic approach in the elderly population needing emergency surgical procedure.

Materials and Methods: preliminary data of the Italian nationwide, multicenter prospective FRAILESEL study were analyzed (ClinicalTrials.gov Identifier: NCT02825082). This analysis was performed with data collected by all members of the ERASO collaborative study group, from December 2016 to November 30, 2017. Variability considered for analysis were age, sex, pre-operative comorbidities and patient fragility, type of procedure performed, timing, morbidity and mortality rate.

Results: a total of 1549 emergency procedure were included in the database during the study period. Of these, 497 were performed laparoscopically. The conversion rate was of 14.9 %. The most common diagnosis was cholecystitis (52.8%) and colorectal diseases (23.6%). The overall morbidity rate was of 33.2% cases. Laparoscopy group morbidity rate was of 20.3% while for Lap-Converted and Open-Planned was of 47.3% and 38.1% respectively (p= 0.118; ns). The overall mortality rate was of 10 % cases. Laparoscopy group mortality rate was of 1.9%, while for the Lap-Converted and and Open-Planned was of 17.6% and 12.7% (p= 0.235; ns).

Conclusion: from a preliminary assessment of the data, it emerged that Laparoscopic approach even in geriatric patients decrease global complications and mortality rates, so it is feasible and safe and should be increased due to more improved outcomes.

Keywords: Emergency surgery, elderly, laparoscopy
Giant strangulated hiatal hernias treated by emergency robot-assisted surgery

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Background
Giant hiatal hernia (GHH) is a condition where one third of stomach is migrated into the thorax. Nowadays laparoscopic treatment when indicated gives excellent perioperative outcomes. Strangulated giant hiatal hernia is rare. Urgent repair is associated with significant morbidity and mortality rates. Minimally invasive and Robotic-assisted approach of these situations are reported, offering some advantages.

Cases presentation
Over a period of 10 years (December 2006 - December 2016) 28 patients affected by giant hiatal hernias were treated using a robot-assisted or conventional laparoscopic surgical approach. In 3 cases a situation of strangulated - non reducible incarcerated hernia was found and treated in emergency. Patients demographic data, morbidity, and surgical details are reported.

We report our experience of the 3 cases of strangulated giant hiatal hernia (10% of our serie of GHH), over a period of 10 years. All the cases were treated by using robot-assisted procedures. All cases were males, they were 47, 70 e 86 years-old. All of them presented with acute outlet obstruction symptoms: abdominal and anterior chest pain associated with acute onset of nausea and vomiting. Diagnosis of hiatal hernia was always a known situation. Chest and abdominal computer tomography and upper endoscopy were always performed. In one case the surgery was immediate, in two cases the operation was performed 24 hours after the admission. During the postoperative period, the most common complications were pulmonary.

Conclusions: The emergent treatment of strangulated hiatal hernia is not completely established, so no clear guidelines are available. The situation leads frequently to life-threatening complications. Acute mechanical outlet obstruction, ischemia of gastric wall or perforation and severe bleeding are the reasons for an emergent surgical indication. In stable condition a minimally invasive approach with abdominal cavity exploration and hernia reduction is possible in many cases. In particular robot-assisted approach may be very interesting in this emergent setting; some problems are related to device availability and operating room staff expertise outside elective surgery

Keywords: Paraesophageal hernia – Hiatal hernia - Gastric strangulation - Gastrectomy - Upside-down stomach - Gastric incarceration - Gastric volvulus – Gastropexy
Frailty and surgical risk in elderly patient undergoing emergency surgery: development and internal validation of Emergency Surgery Frailty Index (EmSFI)

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Introduction: several studies suggest that frailty predisposes elderly to worsening outcome after surgery. Since emergency surgery is associated with higher mortality rates, it is paramount to have an accurate stratification of surgical risk in such patients. The aim of this study is to identify a new pre-operative Frailty Index to assess risk of elderly population underwent acute care surgery.

Material and Methods: for this study the preliminary results of the nationwide multicenter Italian observational study FRAILESEL were considered, involving patients over 65 years of age who require emergency surgical procedures. With the aim of developing an index of fragility in emergency surgery called "EmSFI" (Emergency Surgery Frailty Index), an accurate study of the most common comorbidities and clinical factors was carried out, evaluating its statistical significance in terms of morbidity and mortality. ROC curve analysis was then performed to test the sensitivity and specificity of our Frailty Index and other pre-operative scores.

Results: EmSFI was calculated on a heterogeneous population of 784 patients. The mean value of this was 3.81 ± 2.29 (range 1 to 12). Analyzing the frequencies of morbidity and mortality compared to the various EMSFI classes, these have increased as the value of the index increases. Both the score of P-POSSUM (Portsmouth - Physiological and Operational Severity Score for the EnUmation of Mortality and Morbidity) and EMSFI proved to be moderately accurate predictors of mortality (AUC 0.750 and AUC 0.731 respectively). While as regards morbidity, only P-POSSUM proved to be a moderately accurate test (AUC 0.727).

Conclusion: EmSFI it is an extremely simple, easy-to-use tool in the emergency setting and at the same time reliable enough to calculate the clinical fragility of the elderly patient. However further studies are needed to validate the index in a wider population, including elective surgery and analyzing it according to specific pathologies.

Keywords: Emergency surgery, elderly, frailty, surgical risk, risk score
The ongoing globalization and migration is substantially changing our specialty - the pediatric surgery - worldwide, for sure as well. A specialty, recognized by tradition and per se on one hand as “very special”, or on the other hand is called names in a way like: „since only minors are treated, only minor surgery might be necessary...“ by the adult surgeons. Which for sure is not true.

Using all my impressions out of my multiple worldwide pediatric surgical missions over the time, I would like to try to find an answer for one of the most frequently asked question: “How did pediatric surgeons do this in the past and how they will do it in the future in their home countries?“

It becomes obvious, that even for classical diagnoses like appendicitis, intussusception etc not only our medico – surgical performance and maybe finance have to be of first priority, other issues like “culture”, “language barrier”, “access & finance to health care”, or „socialization and rehabilitation“ do have already and will even play a more important role in our future.

Actually, in Germany the „Fast Track Pediatric Surgery“ is favoured for standard of care in the near future, thus forming the benchmark for all other countries in this communication.

In conclusion, the impressions received showed, that neither for the entirety of all countries nor for one single country an ideal solution has been found, already.
From constipation to lethal fecaloma.
M. Vinot, France

Introduction

The fecaloma is an extremely frequent disease and can occur at any age. Its evolution is benign after treatment in the great majority. In rare cases, it can lead to death following medical and surgical complications. The aging of the population increases the incidence of the pathology and its complications. The aim of this study was to analyze cases of severe fecalomas in a French hospital center.

Method

This retrospective single-center study analyzes all cases of severe fecalomas treated at Laveran Hospital that required surgical and / or intensive care between 2014 and 2018.

Results

During this period, 21 cases of serious fecalomas were included. All patients were at least 75 years old. The clinical presentation was a septic shock in 70% of the cases and all patients were in bowel obstruction. The enema treatment was ineffective in 60% of the cases. Fourteen patients underwent surgery, by Hartmann’s procedure or digestive diversion for bowel perforations or local complications, and by ileocaecal resection for diastatic perforation. Seventy-five percent of the bowel perforations were stercoral perforations, the others were diastatic ones. A damage control strategy was used in 30%. Surgical management was executed in a mean of 2 days. In 10% of cases, digestive perforation was not diagnosed preoperatively. Four patients deceased during the hospitalization (3 after surgery) in multi-organ failure.

Conclusion

This severe evolution of fecalomas is poorly known. Management implies not to ignore a fecal impaction and resides above all in its prevention and in its early diagnosis and treatment. Aggressive surgical treatment should be started earlier.
Outcomes from Pre-Hospital Traumatic Cardiac arrest in a single UK major trauma centre
R. Ardley, United Kingdom

Aims: Anecdotally, survival following traumatic cardiac arrest (TCA) has increased since the development of major trauma networks. We aimed to determine the survival following TCA at a major trauma centre (MTC).

Methods: Analysis of retrospective data from a single MTC database between 2012 and 2015.

Results: 31 adults (mean age 49.6 years, 70% male) and 3 children with a TCA were included in the study. 24 (71%) had blunt trauma, 5 (18%) had asphyxiated, 4 (2%) had penetrating trauma.

Overall, 8 (24%) patients survived. The causes of TCA were hypovolemia (4 patients), hypoxia (3 patients), cardiac tamponade (1 patient). Three patients (75%) with penetrating trauma, 4 (16.6%) with blunt trauma and 1 with asphyxia survived.

Mean length of CPR in survivors was 4.5 min (range 2.0 to 10.0 minutes) compared to 20.6 minutes (range 0.5 to 42.0 minutes) in non-survivors.

Six survivors (75%) were neurologically intact on discharge and 2 had neurological impairment (1 blunt trauma, 1 asphyxia). Three (75%) blunt TCA survivors had a good neurological outcome.

Conclusions: There is appreciable survival following TCA. The survival with good neurological outcome following blunt trauma is higher than historical reports and active resuscitation should be considered in this patient group.
The open abdomen in non-trauma patients: progressive abdominal wall closure using "shoelace technique".

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Introduction
The open abdomen technique after damage control surgery is gaining a growing consent in clinical situations where the abdomen cannot be closed, the infection source cannot be controlled, or there is need for a re-exploration.

Methods
Here we report two cases of Open Abdomen (OA) management for non traumatic hemoperitoneum and post-operative eventration treated from 2016 to 2018 in our Academic Department of General Surgery.

Results
Case 1. A 25-year-old woman underwent ileo-colic anastomosis for an end-ileostomy reversal. She first developed a hemothorax after chest tube removal on 4th, and again a spontaneous one on 7th postoperative day. Coagulation tests showed a previously unknown coagulation factor XIII defect. Due to a spontaneous haemoperitoneum on 6th postoperative day she underwent re-laparotomy. No clear source of bleeding could be found, therefore the necessity to re-explore, the high risk of bleeding, and the poor general condition lead our choice to not close the abdomen.

Case 2. A 65-year-old woman underwent emergeny surgery for perforated diverticulitis with generalized peritonitis. On 3rd postoperative day eventration occurred. The abdomen could not be closed due to extensive visceral edema, and because of the concern for development of abdominal compartment syndrome.

Both patients received negative pressure wound therapy with continuous skin traction ("shoelace technique") and bowel coverage with plastic sheets. Immediate and adequate nutritional support was given. After serial VAC dressing changes, a progressive primary fascia closure with component separation was achieved in both patients. After one year follow-up the first patients developed an incisional hernia, whilst the second one showed no hernia signs.

Conclusion
Laparostomy using negative pressure wound therapy instead of early definitive closure of the abdominal wall should be considered even in non-trauma patients at risk of postoperative intra-abdominal hypertension or abdominal compartment syndrome.
The management of pancreatic abscess in emergency: is open surgery still justified?

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Introduction

Acute pancreatitis evolves in pancreatic abscess (PA) in less than 3% of patients with a mortality rate of 100% if operative treatment is not performed. PA is usually due to the superinfection of a pancreatic pseudocyst as a result of acute necrotizing pancreatitis.

Methods

From 2008 to 2018, 3 cases of pancreatic abscess have been treated in our Academic Department of General Surgery.

Results

Case 1. A 27-year-old man was submitted to surgery for multiple penetrating gunshot trauma involving superior and inferior duodenal flexures, and the superior pancreaticoduodenal artery. A primary closure of the inferior duodenal flexure laceration and a Billroth II procedure were performed. In the postoperative period, the patient developed a PA. A percutaneous CT-guided drainage of the homogeneous fluid collection was performed, and the patient was successfully discharged 80 days from the first operation.

Case 2. A 60-year-old man was admitted in emergency with fever, abdominal pain and general malaise following cholecystectomy and acute pancreatitis. CT scan revealed a heterogeneous 21x18 cm low-density lesion in the pancreatic head. An emergency surgical debridement was performed because of sepsis due to pseudocyst superinfection. The recovery was uneventful, and the patient was discharged 15 days after surgery.

Case 3. A 65-year-old man developed sepsis due to PA following acute pancreatitis for gallstones disease. CT scan revealed a heterogeneous 8x6 cm pancreatic lesion managed by emergency debridement and drainage. The postoperative course was uneventful, and the patient was discharged 17 days after surgery.

Conclusions

The growing consent for minimal invasive approach, as US or CT-guided drainage nowadays seems to be the gold standard for the treatment of pancreatic abscess. Nevertheless, surgical debridement should be still taken into account in the management of patients with critical clinical conditions when the minimally invasive approach is unfeasible or failed.
The management of Mirizzi Syndrome in emergency

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Introduction

Mirizzi Syndrome (MS) is a rare complication of cholelithiasis. In spite of the success of laparoscopic cholecystectomy as a minimally invasive approach to gallstone disease, MS remains a challenge, also for open and robotic approaches, due to the subverted anatomy of the hepatocystic triangle. Moreover, when emergency surgery is needed, the optimal preoperative diagnostic assessment could not be always achievable. We aim to analyse our experience of MS treated in emergency and to assess the feasibility of a diagnostic and therapeutic decisional algorithm.

Methods

From March 2006 to February 2016, all patients with a preoperative diagnosis, or an intraoperative evidence of MS, were retrospectively analysed at our Academic Hospital, including patients operated in emergency or in deferred urgency. 18 patients were included in the study using as exclusion criteria patients treated in elective surgery.

Results

The patients were distributed according to modified Csendes' classification: type I in 15 cases, type II in 2, type III in 0, type IV in 1, type V in 0. In type I group, diagnosis was intraoperatively performed. Laparoscopic approach was performed with cholecystectomy or subtotal cholecystectomy, when the hepatocystic triangle dissection was hazardous. Patients with preoperative diagnosis of acute abdomen, and MS type IV were directly managed by open approach.

Conclusions

Diagnosis and therapeutic management of MS is still a challenge, mostly in emergency setting. Waiting for standardized guide-lines, we propose a decisional algorithm in emergency, especially in non-specialized centres of hepatobiliary surgery.
EVALUATION OF OUTCOMES IN PATIENTS WITH LIVER TRAUMA – A LEVEL 1 TRAUMA CENTRE OBSERVATIONAL STUDY

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INTRODUCTION: Liver is the most commonly injured organ in blunt trauma abdomen. At our institute, we witnessed 207 patients with Liver trauma out of which 132 were high grade liver trauma (Grade 3,4 & 5). Non operative management is the standard of care in liver trauma in today’s world. However, patients with liver trauma present with multiple complications which are more common with patients undergoing operative interventions.

METHODS: We retrospectively evaluated the patients with liver trauma admitted at our trauma centre from Jan 1st 2016 to Dec 31st 2017. Patients were subclassified into AAST grading and outcomes were evaluated on the basis of operative intervention required and mortality. Associated injuries were also taken into account. Interventions like surgery requirement, drain placement for biliary leak, angioembolisation were studied.

RESULTS: In total 346 patients were admitted to JPNATC with liver trauma over last 2 years. About 63% of those constituted high grade liver trauma (grade 3,4 & 5), out of which 46 required operative management and 38 underwent angioembolisation. Of 346 patients, 38 patients died. We further evaluated the interventions required.

DISCUSSION: There has been a paradigm shift in management of liver trauma over last few decades. Non operative management has been a norm. However, high grade liver trauma are associated with a number of complications like biliary leak, hepatic necrosis, bilhemia. Dynamic assessment and timely intervention is required to comprehensively manage such complications.
BACKGROUND: Late aneurysm formation has been reported after every type of surgical coarctation repair. Rupture of such aneurysms represents a life threatening event. Redo surgery carries significant mortality and morbidity. Thoracic endovascular aneurysm repair (TEVAR) is a viable minimally invasive technique to consider in emergency conditions.

METHODS: A 36 years old man presented at the emergency department reporting sudden thoracic pain and dyspnea. Computed tomography (CT) scan at admission showed an isthmic aortic dilatation with a ruptured wall ulcer and a moderate pleural effusion. TEVAR was performed successfully by implanting a Gore TAG 26 26 100 endoprosthesis. A prosthetic left common carotid-subclavian artery bypass was performed for a subsequent left hand ischemia due to intentional left subclavian artery covering during TEVAR. An Amplatzer plug was placed into proximal subclavian artery.

RESULTS: The endovascular procedure was technically successful. No type I endoleak was seen on the final control angiogram. No endograft-related complications have occurred. The patient required a left thoracotomy on day 3 post intervention to evacuate hemothorax due to aortic rupture. Serial follow up with CT scan at 20 months shows regular placement and no evidence of type I endoleak. Still patent the carotid-subclavian bypass.

CONCLUSIONS: Thoracic endovascular repair is a feasible alternative treatment for patients who have already undergone surgical repair of aortic coarctation. It is a rapid procedure useful in patients with poor hemodynamic condition by rupture of aortic aneurysm. Long-term follow-up is required to assess the durability of the stent-graft treatment.
COMPLICATED JOURNEY OF AN INJURED LIVER
HARSHIT AGARWAL MBBS,MS, MCh ALL INDIA INSTITUTE OF MEDICAL SCIENCES

Introduction: Liver trauma patients may present with varied complications including bile leakage, hepatic abscess, hepatic necrosis etc.

Methods: We present a case of a 27 year old gentleman who suffered road traffic injury in May 2017 and was managed in our hospital. Patient was a non responder and underwent damage control surgery followed by angioembolisation. Post surgery his stay was prolonged and complicated. The stay of the patient was complicated by Hepatic abscess, secondary haemorrhage, Major hepatic necrosis and Enterohepatic fistula.

Results: Total hospital stay was of 102 days including ICU stay of 69 days. He was discharged in good health.

Conclusion: Management of patients with liver trauma requires a comprehensive approach along with high index of suspicion. Major hepatic necrosis is a dreadful complication in patients undergoing angioembolisation. Repeated development of hepatic and perihepatic abscess should alert the physician regarding communication with alimentary tract.
EVALUATION OF CLINICAL PREDICTORS AND OUTCOMES IN PATIENTS WITH OPEN ABDOMEN IN TRAUMA – A LEVEL 1 TRAUMA CENTRE STUDY

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Introduction: Open abdomen as a strategy for laparotomy has been known since long. It is an integral part of damage control surgery. It has the advantages of avoiding abdominal compartment syndrome during resuscitative phase in post op period. However, at the same time it contributes to long term morbidity in patients.

Materials and methods: We performed a ambispective observational study (4 years retrospective, 1 year prospective (2103- 2017) at JPNATC, AIIMS, New Delhi. Patients data was retrieved from a prospectively maintained registry at our institute. Patients who underwent laparostomy were included in the study and following parameters were evaluated:

Age, sex, shock index, ISS, fluid resuscitation intraop and 1st 48hrs after surgery, blood transfusions, hollow viscus/solid organ injury. Serum lactate levels, method of temporary abdominal closure, complications of open abdomen, final outcome

Results: A total of >300 patients underwent laparostomy during this period. However, patients with injury AIS>3 in other regions were excluded. We also aim to compare the factors which helped in delayed primary closure of the abdomen at the time of index admission itself. The study is under statistical analysis and results of the study should be completed by April 2018.
Level 2 trauma Center- lessons to be re-learned

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The trauma registers for the First Level Trauma Center are a normal presence in the last 2 years in Italy. Few data are available about number of trauma patients treated at a second level trauma center. In Emilia-Romagna there are 3 level I trauma center and 9 level II Trauma Center. The aim was to evaluate patients treated at a second-level trauma center. All the admissions for trauma at the surgical department of our second-level trauma center for 6 months (July-December 2017) were assessed. During this period there were 14 patients admitted in the emergency surgery department, 12 males, 2 female, median age 42.5 (8-62) years, median ISS of 14.5 (4-29) Among these 8 needed emergency surgical treatment-(57.14%) and 6 cases underwent just conservative treatment. In one case there was a 2-step spleen laceration. The procedures performed were in 5 cases emergency splenectomy, 1 case there was the need for abdominal wall suture in order to achieve haemostasis, and intestinal suture was performed for laceration, and in 1 case the procedure performed was sigmoidectomy due to vascular tear. The activation for the surgeon’s presence in the ED it was in 4 cases, due to dynamics and lesions. The time for the TC was of 75 minutes and the timing of the emergency procedure was 45 minutes. At further analysis it can be seen that the ISS score was much lower generally, the mean tine for recovery was 9.58 (1-64) days, and the overall survival was of 92.85 (13/14). In conclusion even in a second level trauma centre complete training for trauma treatment is needed.

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There is little information available about trauma care for civilian war victims and how their vascular patterns of injury might differ from those of military forces.

**METHODS**

Patients with vascular penetrating injuries treated at EMERGENCY’s Surgical Centre (Kabul) from 2014 to 2016 were retrospectively identified from the operative theater registry. Vascular stab wounds, vascular injuries associated with traumatic amputation on arrival, and mangled limbs judged not salvageable due to extended soft tissue and bone damage were excluded from the analysis. Basic demographic data collected included: age, sex, and characteristics of injury. The mechanism of injury was categorized as bullet injury or blast injury (shell from rockets or high-energy bombs). Vascular injuries were characterized by type (arterial or venous) and location (upper extremity, lower extremity, torso or neck). Vascular repairs were classified in five techniques: ligation, primary repair, interposition grafting with autologous vein, open vessel exploration with embolectomy and/or thrombectomy or vascular shunt. The primary outcome examined was in-hospital mortality.

**RESULTS**

**DEMOGRAPHICS, INCIDENCE, SITE AND OUTCOME OF VASCULAR INJURY**

From December 1 2014 through November 31 2016, 360 penetrating vascular injuries were treated in 306 patients. Forty-one patients were excluded from the analysis; 39 had penetrating vascular stab wounds and two because of missing data. The remaining 265 patients were mostly male (89%) and young (mean age of 26 years). Children accounted for 12.8% of patients. The majority of injuries were from bullets (71%). Blast injuries accounted for 29% of cases.

**Extremity injuries** occurred most commonly; 159 patients (60%) sustained lower extremity injuries and 36 patients (13.5%) sustained upper extremity injuries. The femoral artery was the most commonly injured vessel (37.5%), followed by popliteal (20.3%), brachial (11.6%), tibial (10.6%) and subclavial artery (3.5%). 106 combined arterial and venous injuries were identified for a total incidence of 39.8%. Concomitant bone fractures were identified in 64 patients (24%).

**Truncal vessels** injuries were also frequent. 51 patients (19.2%) were diagnosed with vascular injuries in either the thorax or abdomen. 24 patients (47%) suffered major truncal venous injuries without arterial injury.
Of those patients, 13 had injuries of the inferior vena cava (IVC), 8 of the iliac vein, 1 of the superior vena cava, and 2 of the portal vein.

The mortality rate in patients with lesions of the IVC was 21.4% (3/14).

Injuries to cervical vessels occurred in 19 patients representing 7.15% of those with vascular injury.

Abdominal and chest injuries associated with vascular lesions were present in 24.9% of cases.

**VASCULAR INJURY REPAIR**

196 arterial injuries in 265 patients were identified and repaired.

More than half of the cases (111) sustained segmental artery loss and necessitated interposition venous graft repair. In all cases, the conduit of choice was the saphenous vein from the less traumatized leg.

Direct repair of arterial injuries was chosen in 32 repair procedures, ligation of the artery in 50 cases.

Open vessel exploration with embolectomy and/or thrombectomy was used in only 2 cases. Temporary vascular shunt was used in only 1 case.

174 venous injuries were identified and treated: ligation of the vessel in most cases (154) and venous repair in 20 cases for an incidence of 11.5%.

Fasciotomies were performed in 24.5% of patients with vascular injuries.

**MORTALITY**

Overall mortality was 8.6% (23/265).

Patients with truncal vessel injuries had higher mortality 15.6% (8/51). The mortality rate in patients with an inferior cava vein injury was also increased with 21.4% (3/14) cases resulting in death.

**DISCUSSION**

Two-hundred and sixty-five vascular injuries in a period of 2 years may be one of the largest series of civilian war victims reported from a single Center. Albeit injuries to the vessels of the extremities are most frequently seen; also the most complex truncal vascular injuries (19.2%) occurred and seemed more frequent than those reported in the combat forces (6%). About 25% of these patients also suffered from concomitant lesions in the chest or abdomen, explaining the higher fatality rate. Our experience shows that in a high-volume trauma center for war victims, the vast majority of patients with arterial injuries can undergo definitive surgical treatment with limited use of temporary shunt (only 1/265 needed a temporary shunt in a damage control scenario). In contrast to arterial repair, we support ligation as the treatment of choice for venous injuries.
REFERENCES


Title: Laparoscopic Repair of Perforated Peptic Ulcer with Omentopexy

Authors: Mohan Ramalingam, MD; Chris Myers, DO - USA

Introduction: Perforated viscus remains a cherished pathology that excites resident and attending surgeons alike. It is a diverse surgical disease where without surgery a resolution is unlikely and possibly fatal. With surgery a cure is more often the rule. Over the years, much of surgery has shifted towards laparoscopic minimally invasive methods. Laparoscopic cholecystectomies have long been universally considered the standard or care. Laparoscopy is being used more in stable trauma patients. Over the same period, due to the advent of better acid suppressing therapies many of which have been made over the counter, we see fewer cases of complicated peptic ulcer disease. We believe that laparoscopic repair of perforated peptic ulcer disease should be first-line therapy for stable patients where surgery is indicated, and laparoscopy is not contraindicated.

Presentation: We had a 61 year old male with history only pertinent for Parkinson’s disease, and no previous abdominal surgery who presented to the emergency department (ED) at our institution with a chief complaint of abdominal pain. The pain began suddenly, unprovoked in his epigastric region. It was constant, tearing in nature, worsening and progressively more diffuse causing him to seek medical care. He was evaluated in the ED, found to also be diaphoretic, hypertensive with the added complaint of chest pain. Peripheral IVs were established, he was provided a fluid bolus, started on crystalloid intravenous fluids, routine labs were drawn and he was sent for a CTA thoracic aorta and abdomen and pelvis for concerns of possible aortic dissection. The CT demonstrated a large amount of pneumoperitoneum and free air with a right upper quadrant foci. Laboratory values were normal apart from a leukocytosis of 13,000 cells/mcL and anemia with hemoglobin of 7.9 g/dL. He was started on antibiotics to cover gastrointestinal pathogens. General surgery was promptly consulted for evaluation and management. Further questioning of patient revealed that he had been consuming upwards of 4,000mg daily of ibuprofen for back pain. He was not taking anti-coagulants or anti-platelet medications, nor acid suppression therapy. He was evaluated by a fellowship trained minimally invasive attending surgeon and consented for diagnostic laparoscopy, repair of perforated viscus, possible exploratory laparotomy, possible gastrectomy, possible bowel resection and all indicated procedures.

Description: Patient underwent the usual perioperative course and was brought to the operating theater shortly after evaluation by anesthesia. After establishment of an airway and sterile preparation and draping, pneumoperitoneum was obtained using a Veress through an umbilical incision. A trocar was used to introduce the laparoscope through the umbilicus and all additional trocars were placed under direct vision. Inspection of the peritoneum revealed gross spillage of bilious gastric contents with visible food debris. Much of the contamination was under the right hemidiaphragm and subhepatic space. A 1 cm duodenal perforation was visualized just distal to the pylorus. The repair was performed laparoscopically using three 2-0 vicryl in a figure-of-eight fashion. A flap of well vascularized omentum was mobilized and secured in place over the perforation with several interrupted 2-0 vicryl sutures. Hemostasis was excellent. We used a suction irrigator to fully irrigate the peritoneal cavity with 4L of sterile saline until the effluent ran clear and all visible debris was removed. Skin and fascia were closed. The procedure was complete in around 45 minutes.

Discussion: Here we described a successful treatment of a perforated gastric ulcer using minimally invasive techniques. The patient tolerated the surgery well without complications. We fully expect a shorter hospital course and improved pain control associated with the laparoscopic approach. We have an associated video for presentation purposes.
Management of a severe pancreatic trauma: A case report

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Introduction
Pancreatic injury occurs in approximately 5% of patients with blunt abdominal trauma, furthermore pancreatic injuries to the left of the superior mesenteric portal vein axis involving the neck, body and tail of the pancreas occur in less than 1% of patients with abdominal trauma. These injury are often associated with considerably high morbidity and mortality especially in case of delayed diagnosis, incorrect classification of the injury, or delays in treatment. There is a leak of evidences regarding this argument in literature. We report our experience in management of a blunt trauma in a young man resulting in a complete distal transection of pancreas.

Methods
A 40 year old male with no past medical history involved in a hi-energy blunt trauma (frontal car collision), was carried to the emergency department by helicopter in hemodynamical stability. During ATLS manoeuvres an important hypotension showed up (80/50 mmHg), unresponsive to medical treatment (High dose Noradrenaline and massive fluid resuscitation). Eco FAST showed free fluid in the spleno-renal angle, Morrison pouch and Douglas pouch. Chest and Hip X-ray were negative for lesions. The patient was then immediately taken to the operating theatre for prompt damage control surgery. During the explorative laparotomy an important hemoperitoneum was found and, after systematic packing of all the abdominal quadrants, hemodynamic stability was achieved. After suturing of several bleeding lesions of the meso-colon, cattel-brasch and mattox manoeuvre were carried out showed a full thickness lesion of the pancreatic neck (organ injury scale-OIS III) and a bleeding lesion of the lower pole of the spleen (OIS II). Distal spleno-pancreasectomy, abdominal packing and laparostomy were performed. After surgery the patient became hemodinamycal stable and underwent to total body CT-scan that showed no active bleeding sources. The only reported lesions were right lung contusion, L1 transverse process infraction and left femoral compound fracture. After orthopedic intervention the patient was referred to intensive care unit (ICU). 24 hours later depacking and abdominal wall closure were performed. The patient developed a low volume pancreatic fistula in post-operative day (POD) 12 conservatively treated and was discharged in POD 20.

Conclusion
Post traumatic pancreatic lesions are typically associated with high mortality and morbidity including fistula and L1-L3 vertebral bodies fractures with possible medullary trauma. Blunt trauma of the pancreas is uncommon and isolated pancreatic trauma is even less common. In critically ill patient without the possibility of preoperatory CT scan systematic approach during damage control surgery is mandatory to detect hidden pancreatic lesions that could be underestimated.
Two migrant boys (5yrs, 11yrs) have been admitted to our hospital by their general pediatricians with intermittent abdominal pain and mild signs of bowel obstruction within a few months time. To get the necessary trustworthy background information and to take patient`s history have not been an easy task due to several issues like language barrier, different socialisation and cultural aspects. The clinical condition of the boys deteriorated rapidly, necessitating emergency surgery for release of complete bowel obstruction, even before the diagnosis of a PICA syndrome respectively the ingested cause, matress foam or rubber balloons could be made. The rare syndrome itself and each boy`s recovery and complicated course will be presented in detail and discussed.
Surgical Management of Severe Acute Necrotizing Pancreatitis: Single Centre Experience

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Introduction: The clinical course of patients with severe acute pancreatitis (SAP) can progress to a critical condition demanding involvement of different specialists and a multidisciplinary management approach. Verified infected necrosis and progression of sepsis is generally accepted as a strong indication for surgical intervention. During the past decades, minimally invasive techniques have been developed and proven not to be inferior to the conventional surgical approaches.

The aim of the study was to compare the safety and effectiveness of the new emerging minimally invasive approach – focused open necrosectomy (FON) – and conventional open necrosectomy (CON) in the treatment of necrotizing SAP.

Methods: Analysis of prospectively collected data of patients who developed pancreatic infection during their clinical course of necrotizing SAP (according to the revised Atlanta classification) was carried out. The diagnosis of infected PN was established by direct CT evidence of retroperitoneal gas, progression of sepsis or positive cultures after percutaneous or invasive drainage. Patients were stratified in two groups according to the surgical technique: conventional open necrosectomy (CON) vs. ultrasound-assisted focused open necrosectomy (FON). The type of intervention, complications (according to the Clavien-Dindo Classification of surgical complications, grade III-IV) and the main outcomes were analysed.

Results: During the period from January 2000 to February 2017, a total of 452 patients were treated for SAP. In 359 (79%) patients, infection of pancreatic necrosis was proved. In 117 (45%) patients, the extent of pancreatic necrosis exceeded 50%. In 97 (27%) patients, the infection was managed without surgical intervention.

128 patients underwent CON, and in 96 patients source control was achieved by the means of FON. The median hospital stay was 68 (IQR 12) days in the CON group and 41 (IQR 8) days in the FON (p=0.092) group, accordingly. The median ICU stay was 35 (IQR 9) days in the CON group vs. 19 (IQR 13) days in the FON group.
Mortality reached 14.84% (19) in the CON group and 7.29% (7) in the FON group (p=0.08). 31 (24.21%) patients from the CON group and 9 (9.37%) in the FON group suffered from post-operative bleeding (p=0.004). GI fistula developed in 12 patients (9%) from the CON group vs. 8 patients (7%) from the FON group (p=0.073).

**Conclusion:** Ultrasound-assisted focused open necrosectomy is feasible and safe in patients with infected pancreatic necrosis that results in a significantly lower post-operative bleeding and a comparable hospital and ICU stay and mortality rate.
Upper Gastrointestinal Bleeding: 8-Year Experience in a Single Institution
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A total of 854 patients were admitted to the institution between 2010 and 2018. The bleeding source in 84% of patients was gastro-duodenal ulcer. Most frequently, in 33.5% of cases, the ulcer corresponded to type IIB according to the Forrest classification, followed by IIc, IIa and Ib. Repeated bleeding after endoscopic haemostasis was observed in 119 patients, reaching 16.5% of all patients included in the study. Repeated bleeding was most often observed on the same day, in 37.8% of cases, and within 24 hours. The incidence of rebleeding gradually decreased towards day 4. A low risk of rebleeding was noticed until days 5–7 (2.5%–1.7%), and dropped down to less than 1% on day 8. Unsuccessful endoscopic haemostasis during the first day after endoscopy was an indication for emergent surgical intervention in 53 cases. Transarterial embolization (TAE) was performed in 75 cases as definitive haemostasis when primary endoscopic haemostasis had failed or surgeons suggested the possibility of an increased risk of repeated bleeding, reaching 10.2% from the total number of patients with upper gastrointestinal bleeding. From 75 patients who underwent embolization, preventive TAE was performed in 49 cases with only one rebleeding episode in this group of patients. The overall hospital and ICU stay was significantly longer in patients who underwent surgical intervention compared to the embolized group, a median of 11 days (IQR 15.75-9.0) vs. 7 days (IQR 12.25-6.0) and a median of 5 days (IQR 7.0-3.0) vs. 3 days (IQR 5.0-2.0), p< 0.001; p<0.001, respectively. An
unfavourable outcome was not significantly different, 5.3% vs. 13.8% (4 and 16 patients), in the embolization group vs. the surgical group, p=0.064.

Conclusion

The risk of repeated bleeding remains high during the first three days after endoscopic haemostasis in patients with nonvariceal upper gastrointestinal bleeding. Transarterial embolization is feasible and safe and is not inferior to surgical haemostasis in high risk patients. Preventive TAE is a promising type of definitive haemostasis in high risk patients; however, a prospective inclusion of a larger number of patients is necessary to demonstrate a significant difference.
Survival Analysis of 99 Consecutive Patients Treated with Vacuum-Assisted Abdominal Closure for Complicated Intra-Abdominal Infection and Peritonitis

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Background. Vacuum-assisted abdominal closure (VAAC) is recognized as a lifesaving therapy in patients who need it following the open abdomen strategy. The aim of this study is the identification of clinical and laboratory parameters that may be prognostic for a favourable outcome after the application of VAAC.

Materials and Methods. In total, 99 consecutive patients with complicated intra-abdominal infection (CIAI) and peritonitis were treated in our institution using the KCI ABThera VAAC systems during the period from January 2011 to December 2017. Statistical analysis was performed comparing the survivors and non-survivors. The variables included patient data, like age, gender, and comorbid conditions according to the ASA Physical Status Classification System score. Also, the severity of inflammatory response reflected by the presence of multiple organ dysfunction syndrome (MODS), the incidence of severe sepsis and septic shock, laboratory and biochemical markers of inflammation, such as the platelet count, creatinine, C-reactive protein (CRP), procalcitonin (PCT), and lactate levels served as variables. The number of VAAC changes, the duration of the VAAC therapy, the amount of abdominal aspirate, the length of ICU and hospital stay and the main outcomes were compared in groups.

Results. From a total of 99 patients, 77 survived. The survivors were significantly younger compared to the non-survivors, with a median age of 62 years (IQR 49-74) vs. 72 years (IQR 59-83) accordingly, P=0.015. 61% of patients among the survivors were males; however, males made up 59% of the non-survivors as well, P=1.0. The ASA score was significantly lower in the survivors’ group, a median of 3 (IQR 3-4) vs. 4 (IQR 4-4), P<0.001. MODS developed in 39.7% of the survivors, compared to 70% in the non-survivor group, P=0.02, and had fewer cases of severe sepsis and septic shock, 41.6% vs. 72.7% accordingly, P=0.04. Platelet count was not significantly different during the first application of VAAC, with a median of 271 x10^9/L (IQR 203-426) vs. 245 x10^9/L (IQR 189-341), P=0.23; however, it was lower in the survivors on postoperative days 1 and 3, with a median of 267 x10^9/L (IQR 195-403) vs. 183 x10^9/L (IQR 165-228) x10^9/L and 286 x10^9/L (IQR 202-411) vs. 120 x10^9/L (92-181) x10^9/L.
respectively, \( P<0.001 \). Creatinine levels were significantly lower on the day of intervention in the survivors, a median of 85.6 \( \mu \text{mol/L} \) (IQR 63-129) vs. 162 \( \mu \text{mol/L} \) (IQR 114-243) respectively, \( P=0.001 \); CRP did not differ significantly, \( P=0.564 \), as well as PCT, \( P=0.43 \). However, PCT was significantly lower in the survivors on postoperative day 1, a median of 6.6 ng/mL (IQR 2-30) vs. 36.9 ng/mL (IQR 3-103), and on day 3, a median of 3.6 ng/mL (IQR 0.9-11) vs. 15.3 ng/mL (IQR 5-33), \( P=0.02, P=0.03 \) respectively. Lactate was significantly lower in the survivors on the day of surgical intervention, 1.8 mmol/L (IQR 1.5-2.6) vs. 2.5 mmol/L (IQR 2-3.2), and on postoperative day 1, 1.9 mmol/L (IQR 1.5-2.6) vs. 2.4 mmol/L (IQR 2.1-3.8), \( P<0.001 \) and \( P=0.007 \), accordingly. Yet, there was no difference on postoperative day 3, \( P=0.17 \). The duration of the VAAC therapy, the number of VAAC changes, the volume of abdominal aspirate, and the length of ICU stay did not differ significantly, \( P=0.9, P=0.8, P=0.1, P=0.2 \). Still, the hospital stay was longer in the survivors’ group, a median of 23 days (IQR 19-32) days vs. 19.5 days (IQR 10-27), \( P=0.022 \). The mortality rate reached 22.2%. The logistic regression model revealed that the survivors were more likely to be younger (Odds Ratio, OR 0.88, Confidence Interval, CI 0.79-0.98, \( P=0.024 \)) and have lower lactate levels on the first postoperative day (OR 0.5, CI 0.28-0.9, \( P=0.022 \)).

**Conclusion.** Several prognostic factors may have an impact on patient survival. The survivors were younger males with lower creatinine levels on admission, a lower PCT within 24 hours from surgical intervention that showed a decrease within a 72-hour period. Normal or not significantly elevated lactate levels on the day of intervention, without an increase within the following 24 hours, were found as a superior survival predictor. MODS, severe sepsis and septic shock not being as independent risk factors, however, were clear markers of a poorer prognosis. VAAC changes and duration had no impact on survival and ICU stay.
Abstract

Purpose To review the management of traumatic blunt splenic injury in patients aged 0-18 years, at a single UK major trauma centre, focusing upon efficacy of non-operative management and use of haemodynamic stability rather than injury grade as a guide to treatment, creating an algorithm for management.

Methods Retrospective, cross-sectional study of patients admitted with traumatic blunt splenic injury between January 2011 and March 2016. Penetrating injuries were excluded. Follow up was for 30 days.

Results 30 Patients were included, mean age was 14.5 (SD 3.6). 6 Patients (20%) had a splenectomy, 22 patients (73%) were treated non-operatively with 100% efficacy. 5 patients (63%) with grade V injuries were managed non-operatively. Injury grade was not associated with surgical intervention (p=1.57). Haemodynamic instability was a significant predictor of requirement for surgical intervention (p=0.03), however haemodynamic instability treated initially with fluid resuscitation, did allow successful non-operative management in 5 patients (45%). Haemodynamic instability was also associated with admission to critical care (p=0.017), presence of additional injuries (p=0.015) and increased length of stay (p=0.038), all were unrelated to radiological injury grade.

Conclusions Non-operative management should be first line treatment in the haemodynamically stable child and carries a high degree of efficacy. It may also be successfully implemented in those with initial haemodynamic instability responsive to fluid resuscitation. Radiological injury grade does not predict management, level of care or length of stay. Haemodynamic stability may be utilised to produce a simple treatment algorithm and is key to guiding management.
The Cost Effectiveness Potential of Using Thrombelastography (TEG) in the Haemorrhaging Major Trauma Patient.
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Introduction
£150m is spent on average per year on the most severely injured (ISS >15). Although the cost is ethically justified, medical teams continually search for areas of improved patient care and cost saving. The primary aim of this study was to establish if there is a cost saving when using a TEG directed massive transfusion protocol (MTP) verses a standard MTP.

Methods
Retrospective data was collected on 122 trauma patients who activated the MTP in a UK level 1 major trauma centre over a 13 month period (pre-TEG group). Prospective data was then collected on 126 patients over a 12 month period (post-TEG group), following introduction of a TEG directed MTP. The number and type of blood product transfused, wasted or returned was recorded and total costs calculated. The price of coagulation tests and TEG cartridge tests were accounted for.

Results
The total cost of transfusion (blood product transfused and wasted) pre-TEG was £809.69, post-TEG was £847.42 including an average of 2.59 TEG cartridges used per patient who received blood. Cost of standing down MTP pre-TEG was £218.84, and post-TEG was £62.06. Overall the cost saving of TEG directed MTP was £119.05 per patient. Survival significantly improved 6.78% at 24 hours and 11.67% at 30 days, p=0.023 (chi-squared) with TEG directed MTP.

Conclusion
We would advocate using TEG to goal direct MTP practices due to improved accuracy of transfusion, cost saving and improved survival rate.
Outcomes of salvage emergency surgery for bleeding peptic ulcer

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Abstract

Introduction
The goals of management of bleeding peptic ulcer disease (BPUD) are early diagnosis, prompt resuscitation and urgent endoscopy to stop bleeding. Last few decades have witnessed a diminishing role of surgery in the management of BPUD. When non-operative strategies such as endoscopy and angioembolization fail to achieve hemostasis, surgery is the only salvage.

Method
This is a retrospective study of 70 patients with BPUD who underwent emergency surgery from January 2002 to December 2014. Demographic profile, clinical parameters and perioperative outcomes were studied. Baseline data of survivors was compared with non survivors. Outcome of patients with > 2 endoscopic attempts was compared with ≤ 2 endoscopic attempt patients.

Results
Mean age of the patients was 68.5 years (range 38 – 93) and majority was male (85.7%). 12 patients (17.1%) were on long term antiplatelet therapy including one patient on dual antiplatelets. An additional 9 patients (12.9%) were on long term use of non steroidal anti inflammatory drugs (NSAID). Two patients developed BPUD while on chemotherapy. The mean hemoglobin level prior to surgery was 7.9 g/dl. 67 patients (95.7%) received a mean 1402.3mls packed red blood cells (PRBC) transfusion prior to operation. 39 patients (55.7%) had duodenal ulcers (DU). The most common location of gastric ulcers (GU) was incisura (n=16, 51.6%). Most patients had 2 endoscopic procedures before surgery was mandated. The most frequent operations performed was under running of duodenal ulcer (n=40, 57.1%). Average operative time was 170.1 minutes (59 – 316 minutes). Mean blood loss was 1067.1 mls (50 – 6000 mls). 59 patients (84.3%) developed complications and 30-day mortality was 15.7%. There was no difference in demographic and clinical profile of survivors compared to non-survivors. Patients who received > 2 endoscopies had lower hemoglobin (p=0.01) compared to patients with ≤ 2 endoscopies but there was no difference in 30-day mortality (p=0.68).

Conclusion
Exhaustive non operative strategy and reserving surgery as salvage in refractory BPUD gives acceptable outcomes.

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BACKGROUND:
Open abdomen (OA) permits the application of damage control surgery principles when abdominal trauma, sepsis, severe acute peritonitis and abdominal compartmental syndrome (ACS) occur.

METHODS:
Non-traumatic patients treated with OA between January 2010 and December 2015 were identified in a prospective database, and the data collected were retrospectively reviewed. Patients' records were collected from charts and the surgical and intensive care unit (ICU) registries. The Acosta "modified" technique was used to achieve fascial closure in vacuum-assisted wound closure and mesh-mediated fascial traction (VAWCM) patients. Sex, age, simplified acute physiology score II (SAPS II), abdominal compartmental syndrome (ACS), cardiovascular disease (CVD) and surgical technique performed were evaluated in a multivariate analysis for mortality and fascial closure prediction.

RESULTS:
Ninety-six patients with a median age of 69 (40-78) years were included in the study. Sixty-nine patients (72%) underwent VAWCM. Forty-one patients (68%) achieved primary fascia closure: two patients (5%) were treated with VAWC (37 median days) versus 39 patients (95%) who were treated with VAWCM (10 median days) (p = 0.0003). Forty-eight patients underwent OA treatment due to ACS, and 24 patients (50%) survived compared to 36 patients (75%) from the "other reasons" group (p = 0.01). The ACS group required longer mechanical ventilator support (p = 0.006), length of stay in hospital (p = 0.005) and in ICU (p = 0.04) and had higher SAPS II scores (p = 0.0002).

CONCLUSIONS:
The survival rate was 62%. ACS (p = 0.01), SAPS II (p = 0.004), sex (p = 0.01), pre-existing CVD (p = 0.0007) and surgical technique (VAWC vs VAWCM) (p = 0.0009) were determined to be predictors of mortality. Primary fascial closure was obtained in 68% of cases. VAWCM was found to grant higher survival and primary fascial closure rate.
Feasibility Study of Humidified Carbon Dioxide on Surgical Site Infection rates in patients undergoing Emergency Laparotomy

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Aims

Surgical Site Infection (SSI) following emergency laparotomy is common. Humidified carbon dioxide diffused into the peritoneal cavity during surgery has been suggested to reduce SSI rate. We aimed to investigate the effect of humidified carbon dioxide on SSI rate in a high-risk patient population undergoing emergency laparotomy.

Methods

Data was prospectively collected from emergency laparotomy procedures in a tertiary referral surgical unit from December 2016-December 2017. Surgeons were given the option to use humidified CO₂ (Humigard™) or to operate as per usual practice (i.e. without Humigard™). Data collected included age, sex, American Society of Anaesthesiology (ASA) grade, surgical wound classification, length of procedure and SSI incidence. SSI was assessed by direct wound review for inpatients and a telephone questionnaire 30 days post-operatively.

Results

292 patients underwent emergency laparotomy; 53 received Humigard. In the usual practice v Humigard groups, there were 52% v 45% males and mean age (years) was 58.1(19.7-93.6) v 65.2(26-88) respectively. ASA grades for usual practice v Humigard groups were: I (6.6 vs 5.7); II (34.5 vs 30.2); III (37.6 vs 39.6); IV (20.1 vs 17); V (0.4 vs 5.7). Wound classification grades for usual practice v Humigard groups were: clean (17.9 vs 24.5); clean contaminated (38.9 vs 50.9); contaminated (27.1 vs 18.9); dirty (16.1 vs 5.7). SSI rates were: usual practice 48.5 % v Humigard 45.3% (p=0.63).

Conclusion

Postoperative SSIs are a burden on NHS resources and significantly delay patient recovery. This ongoing study found that humidified carbon dioxide in its current delivery method at the time of surgery did not reduce SSI rate. Factors such as noise artefact, ease of placement in peritoneal cavity, and device efficacy may have influenced effective delivery of the carbon dioxide. Correction of such factors may ensure optimum delivery and better outcomes.
EFFECT OF POLYTRAUMA ON OUTCOME IN TBI PATIENTS ADMITTED TO NEURO-ICU

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Background. A third of injury-related deaths have a concomitant traumatic brain injury (TBI) and up to 50% of severe TBI die. As cardiorespiratory instability worsens the prognosis of TBI patients, it seems obvious that the polytrauma worsens the outcome of TBI patients. The aim of this retrospective cohort study was primarily to look for the possible role of polytrauma in worsening the TBI outcome. Secondarily, the impact of the single physiologic derangements on outcome was explored.

Methods. We retrospectively collected data on 193 severe/moderate TBI patients, with or without polytrauma (defined as two or more body regions involved; table 1) admitted in the Neuro-ICU between 2011-2012. Groups were compared according to demographic, type and severity of injury (GCS, Glasgow Coma Scale), survival time and Glasgow Outcome Scale-Extended (GOSE) at more than 1-year post- injury. Categorical data were analyzed with Fisher exact or Person chi-square test, an appropriate t-test was used for continuous variables. We made two hypotheses to analyze the causal role of polytrauma in affecting the prognosis in polytrauma patients. First, we hypothesized that TBI patients with polytrauma had a shorter time-to-death due to the more severe condition at presentation. The Log-rank Mantell-Cox test was performed for prediction of time-to-death. Second, we hypothesized that the prognosis was more severe both in terms of mortality and disability. Mortality and disability were analyzed as categorical variables, comparing Good Outcome vs Bad Outcome, defined as a GOSE ≤4. Due to the categorical nature of the GOSE and the possible unbalance between the different categories, an Ordered Logistic Regression, where the GOSE is an ordinal scale (range 1-8) was used. Cox models were performed to assess the effect of determinants on survival time.

Results. Thirty-five percent of patients had an associated polytrauma with traffic-related injury as the main mechanism. TBI-alone group was significantly older, with more comorbidities and use of antiplatelet and anticoagulants, however, TBI with polytrauma showed a deeper derangement of physiology (hypotension, acidosis, anemia and coagulation disturbances, p<0.02; table 2). Despite no difference in severity of trauma (GCS-score) and in-hospital mortality rate, TBI with polytrauma significantly died earlier (median survival time 3.5 vs 18 days, Log-rank Mantell-Cox test p= 0.016; figure 1). Anyway, we found a trend towards increased overall mortality in
TBI-alone group (table 2). Univariate, considering GOSE ≤4, and Ordered Logistic Regression did not find an impact of polytrauma on GOSE, even though the threshold analysis suggested an effect of polytrauma in reducing the severest 3 categories of outcome and a disproportionate increase in the good recovery subgroup (figure 2). Cox survival analysis demonstrated an association between the mortality and age, GCS-score ≤8, intracranial hypertension and hypo-coagulation regardless of being TBI-alone or TBI with polytrauma (table 3).

**Conclusion.** This study shows little, if any, effect of other district injuries in the outcome of moderate/severe TBI patients. TBI patients with polytrauma die earlier but not more frequently, i.e. the polytrauma shorten the prognosis of not-survivable patients. Moreover, our data suggest that the brain injury leads the Bad Outcome. This unexpected result is highlighted by the absence of outcome differences (GOSE ≤4) between patients with and without polytrauma. When considering the patients that survive with an acceptable quality of life, polytrauma seems to increase the odds toward a recovery with mild disability. However, we were not able to discriminate if that disability was related to a central nervous system injury. Further prospective studies are needed to delineate if polytrauma is just a bystander in the eventual outcome of TBI or has a causal role.
Table 1. Classification of injured regions in TBI patients with polytrauma (n=67)

<table>
<thead>
<tr>
<th>Associated region</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal injury</td>
<td>1</td>
</tr>
<tr>
<td>Vessel dissection</td>
<td>3</td>
</tr>
<tr>
<td>Extremity injury</td>
<td>28(42%)</td>
</tr>
<tr>
<td>Abdominal injury</td>
<td>11(16%)</td>
</tr>
<tr>
<td>Pelvic injury</td>
<td>10(15%)</td>
</tr>
<tr>
<td>Thoracic injury</td>
<td>30(45%)</td>
</tr>
</tbody>
</table>

Extremity injury was defined as any bone injury over the four limbs. Thoracic and abdominal injuries were defined as injuries to the organs or vertebral fractures included in the regions found on Chest-X-ray or CT scans. Pelvic injury included any bone lesion or organ injury included in the pelvic cavity. Spinal cord injury and vessel dissection were also considered.

Table 2. Demographics, clinical characteristics and outcome of patients with trauma

<table>
<thead>
<tr>
<th>Variables</th>
<th>TBI-p (n=67)</th>
<th>TBI-alone (n=126)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General characteristics and comorbid status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>44.25(20.21)</td>
<td>53.4(26.55)</td>
<td>0.01</td>
</tr>
<tr>
<td>Gender, male(%)</td>
<td>52(78)</td>
<td>90(71)</td>
<td>-</td>
</tr>
<tr>
<td>Mechanism of trauma, n(%)1</td>
<td>49(73)</td>
<td>42(33)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypertension, n(%)</td>
<td>8(12)</td>
<td>32(25)</td>
<td>0.01</td>
</tr>
<tr>
<td>Anticoagulation, n(%)</td>
<td>5(7)</td>
<td>31(25)</td>
<td>0.001</td>
</tr>
<tr>
<td>Disaggregation, n(%)</td>
<td>1</td>
<td>16(13)</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>Clinical/laboratory characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCS(≤ 8), n(%)</td>
<td>41(61)</td>
<td>71(56)</td>
<td>-</td>
</tr>
<tr>
<td>GCS motor(&lt;3), n(%)</td>
<td>27(40)</td>
<td>39(31)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Risk factors pre-admission and during ICU stay</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypotension (&lt;90 mmHg), n(%)</td>
<td>21(31)</td>
<td>7(5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypoxia (&lt;90% O2), n(%)2</td>
<td>12(18)</td>
<td>16(13)</td>
<td>-</td>
</tr>
<tr>
<td>Hypothermia, n(%)</td>
<td>24(36)</td>
<td>43(34)</td>
<td>-</td>
</tr>
<tr>
<td>Decompressive craniectomy, n(%)</td>
<td>19(28)</td>
<td>26(21)</td>
<td>-</td>
</tr>
<tr>
<td>Intracranial hypertension, n(%)</td>
<td>13(19)</td>
<td>13(10)</td>
<td>-</td>
</tr>
<tr>
<td>PTCI, n(%)</td>
<td>9(13)</td>
<td>19(15)</td>
<td>-</td>
</tr>
<tr>
<td>Haemoglobin, mean (SD)</td>
<td>10.37(2.24)</td>
<td>11.37 (2.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Platelets, mean (SD) count &lt;126*10(^3)mcL (^4)</td>
<td>157(79)</td>
<td>192(75)</td>
<td>0.004</td>
</tr>
<tr>
<td>PT, mean (SD)</td>
<td>24(36)</td>
<td>22(17)</td>
<td>0.006</td>
</tr>
<tr>
<td>PTT, mean (SD)</td>
<td>3.2(14.8)</td>
<td>1.3(0.7)</td>
<td>-</td>
</tr>
<tr>
<td>Acidosis (pH &lt;7.34) (^4)</td>
<td>22(33)</td>
<td>22(17)</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Outcome measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-hospital mortality, n(%)</td>
<td>13(19)</td>
<td>25(20)</td>
<td>-</td>
</tr>
<tr>
<td>Overall mortality, n(%)</td>
<td>15(22)</td>
<td>43(34)</td>
<td>0.06 trend</td>
</tr>
<tr>
<td>ICU length of stay, days</td>
<td>9(1.16)</td>
<td>9.36(0.9)</td>
<td>-</td>
</tr>
<tr>
<td>GOSE ≤4 at more than 1 year, n(%)</td>
<td>29(43)</td>
<td>62(49)</td>
<td>-</td>
</tr>
</tbody>
</table>

TBI-p= TBI with polytrauma, TBI-alone= isolated TBI. 1A dummy variable was tested, including: road traffic, domestic fall, assault, other events. Significant results are related to road traffic. 2The percentage of intubated patients is the same between groups. 3PTCI (Post Traumatic Cerebral Ischemia). 4A dummy variable was tested, organizing variables in quartiles. 5Glasgow Outcome Scale (GOSE).
Figure 1. Mortality in TBI patients with or without polytrauma

Figure 2. Distribution of GOSE scores between TBI patients with or without polytrauma

<table>
<thead>
<tr>
<th>Variables</th>
<th>coef(95% CI)</th>
<th>Wald</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOSE 1</td>
<td>-0.99 (-1.45 -0.52)</td>
<td>17.28</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>GOSE 2</td>
<td>-0.87 (-1.33 -0.41)</td>
<td>13.60</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>GOSE 3</td>
<td>-0.52 (0.98 -0.79)</td>
<td>5.30</td>
<td>0.021</td>
</tr>
<tr>
<td>GOSE 4</td>
<td>-0.25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GOSE 5</td>
<td>-0.23</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GOSE 6</td>
<td>0.31</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GOSE 7</td>
<td>1.08 (-0.75 -0.30)</td>
<td>20.01</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>polytrauma</td>
<td>0.22</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure shows the plot of 8-point GOSE for TBI patients with (TBI-p) and without (TBI-alone) polytrauma. Table shows results of Ordered Logistic Regression. GOSE 8 and TBI are used as reference levels.
Table 3. Multivariate Cox regression analysis of variables associated with mortality

<table>
<thead>
<tr>
<th>Variables</th>
<th>hazard ratio (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>1.03 (1.01- 1.06)</td>
<td>0.003</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1.25(0.56- 2.82)</td>
<td>-</td>
</tr>
<tr>
<td>Anticoagulation</td>
<td>1.29(0.50- 3.38)</td>
<td>-</td>
</tr>
<tr>
<td>Disaggregation</td>
<td>0.97(0.44- 2.13)</td>
<td>-</td>
</tr>
<tr>
<td>GCS(≤ 8)</td>
<td>5.99(1.77- 20.32)</td>
<td>0.004</td>
</tr>
<tr>
<td>GCS motor(&lt;3)</td>
<td>2.50(1.10- 5.68)</td>
<td>0.028</td>
</tr>
<tr>
<td>Isolated TBI vs polytrauma</td>
<td>0.76(0.29- 1.94)</td>
<td>-</td>
</tr>
<tr>
<td>Hypotension (&lt;90 mmHg)</td>
<td>0.30(0.09- 1.05)</td>
<td>-</td>
</tr>
<tr>
<td>Hypoxia (&lt;90% O₂)</td>
<td>2.26(0.83- 6.15)</td>
<td>-</td>
</tr>
<tr>
<td>Hypothermia (&lt;35°C)</td>
<td>0.75(0.34- 1.68)</td>
<td>-</td>
</tr>
<tr>
<td>Decompressive craniotomy</td>
<td>0.61(0.25- 1.51)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Intracranial hypertension</strong></td>
<td><strong>3.51(1.35-9.08)</strong></td>
<td><strong>0.010</strong></td>
</tr>
<tr>
<td>PTCI</td>
<td>1.58(0.65- 3.85)</td>
<td>-</td>
</tr>
<tr>
<td>Hemoglobin (&lt;10 g/dL)</td>
<td>1.17(0.49- 2.81)</td>
<td>-</td>
</tr>
<tr>
<td>platelets count (&lt;126*10³mcL)</td>
<td>2.62(1.03- 6.68)</td>
<td>0.04</td>
</tr>
<tr>
<td>PT (&gt;1.35 INR)</td>
<td>2.86(1.12- 7.31)</td>
<td>0.03</td>
</tr>
<tr>
<td>PTT(&gt;1.12 ratio%)</td>
<td>1.28(0.53- 3.09)</td>
<td>-</td>
</tr>
<tr>
<td>Acidosis (pH &lt;7.34)</td>
<td>0.73(0.31- 1.73)</td>
<td>-</td>
</tr>
</tbody>
</table>

Cox multivariate proportional hazards regression.
WSES Survey: OBA (Operative management in Bariatric Acute abdomen) TRIAL. 

Late complications of bariatric surgery: the role of the acute care surgeon.

Belinda De Simone,1 Luca Ansaloni2, Massimo Sartelli3, Federico Coccolini2, Yoram Kluger4, Walter L Biffl5, 106 contributors from WSES (OBA Trial group of study), Fausto Catena6

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Contributions
BDS and FC conceived the study; BDS wrote the survey; FC revised and approved the survey; Fco, LA, MS approved the survey; all the authors accepted to answer to survey and approved the study

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Key Words
Late complications
Outcomes Bariatric Surgery
Emergency Surgery
Acute Abdomen after bariatric surgery

Abstract

Backgrounds
Morbid obesity occurs in 2-5% of the Western population and is associated with a high incidence of important co-morbidities.
Bariatric surgery is the only method that has been shown to achieve long term weight loss and treats co-morbidities.
The number of bariatric procedures performed by bariatric surgeons is increasing. This results in an increasing number of bariatric surgery patients presenting with abdominal pain to the local emergency department. Due to the wide variety of surgical bariatric techniques, the outcomes and late complications from bariatric surgery are not still well known and understood.
The aim of this study is to report the experience of international emergency surgeons in the management of these patients, focusing on those with late complications that can be life-threatening if missed and left untreated.
Method
This is an international web survey carried out with the aim to collect data about emergency surgeons experience in the management of patients admitted for Acute Abdominal Pain (AAP) after bariatric surgery.

The 26-question survey was sent on the 28th January 2018 via Google Forms, after approval of the project steering committee composed by Fausto Catena (Parma Trauma Center-Italy), Luca Ansaloni (Cesena Trauma Center-Italy), Yoram Kluger (Israel) Walter L. Biffl (California-USA) to the mailing list of World Society of Emergency Surgery (WSES) members.

Deadline to participate: 28th March 2018.

Project main objectives:
1) report epidemiological data and clinical-pathological features about this population of patients admitted in Emergency Department for acute abdominal pain;

2) highlight life-threatening late complications and outcomes of bariatric surgery;

3) analyze decision-making algorithms of emergency surgeons in the management of AAP in patients with previous history of bariatric surgical procedures to determine best practices for early diagnosis, and best operative and non-operative treatments to decrease morbidity and in-hospital mortality rates.

Results
One hundred sixteen international emergency surgeons (ES) decided to join the project and answer to web survey.

Sixty three percent of respondents work in university hospitals, 13.8% in a Level 1 Trauma Center. Most participants (57.8%) have over 10 years of surgical experience; and 25.9% have a surgical activity of between 5 and 10 years. The majority of ES (55.2%) work in a hospital with a bariatric unit and almost all (97.4%) in a hospital with an Intensive Care Unit (ICU). Only 40.5% of participants had bariatric surgery experience, while 59.5% has no experience in bariatric procedures.

Almost all surgeons (98.3%) have been consulted to evaluate an AAP after bariatric surgery in an Emergency Department (ED). Only 22.4% of ES declared to have had experience in the management of over 20 bariatric patients with AAP, while 52.6% of ES reported that they managed less than 10 bariatric patients with AAP.

According to ES answers, we found that 37.1% of bariatric patients admitted with AAP did so less than 4 weeks after the bariatric surgical procedure, 25% after more than 1 year, 22.4% were admitted between 4 weeks and 6 months following the procedure, and 15.5% were admitted between 6 months and 1 year after bariatric surgery.

The majority of patients were female (76.7%) over 40 years old (48.3%), capable of reporting their surgical history and conscious of the type of surgical procedure received.

The majority of patients consulted ED after having been submitted to Sleeve Gastrectomy, 31% to Laparoscopic Roux-en-Y Gastric bypass.

The examined patient was operated in the same hospital of the ES on call for 37% of participants and in a private hospital for 32.8% of answers.

The most common complaint was generalized abdominal pain (64.7%), followed by vomiting (51.7%) and localized abdominal pain (40.5%).

Diagnostic laboratory exams were performed, including: Count Blood Cells (CBC), electrolytes, Protein C-Reactive (PCR) and/or procalcitonine in 36.2% of cases; CBC, blood gas analysis,
lactates, PCR and/or procalcitonine in 31% of cases; and CBC, liver function tests, dosage of lipase, troponine, PCR and/or procalcitonine in 25% of cases. Eighty six (74.1%) ES reported that laboratory exams were a useful diagnostic tools, and 30 (25.9%) ES, not.

Radiological exams performed included: plain abdominal radiography and enhanced Computed Tomography (CT) in 42.2% of cases, followed by abdominal CT with intestinal opacification in 41.4% of cases, and plain abdominal radiography in standing position and US abdominal examination, in 13.8% of cases.

Radiological exam results were reported to be useful in the decision-making of 108 ES (93.1%). Sixty one (52.6%) ES took into operating room the patient with a clear diagnosis; 60 (51.7%) ES because of worsening abdominal pain, 30 (25.9%) ES for inconclusive findings.

Timing for surgery was between 12 and 24 hours for 49 ES (42.2%), < 12 hours for 41.4% of participants and > 24 hours for 12.9% of ES.

Surgical exploration was performed by laparoscopy in more than 50% of cases for 56 ES (48.3%), by laparoscopy in less than 50% of cases for 24 ES (20.7%), laparotomy in more than 50% of cases for 19 ES (16.4%), by laparotomy in all cases for 16 ES (13.8%).

The most common intra-operative diagnosis was internal hernias (49.1% of cases), adhesions (41.4% of cases), anastomotic stenosis (12.1% of cases), intussusception (7.8 % of cases), and intestinal volvulus (6.9% of cases).

In hospital mortality rate reported was <10% in 69% (80) of answers.

Fifty six (48.3%) of ES reported their patients required ICU following surgery.

The majority of treated patients were discharged alive (95.7%-111 ES).

Eighty ES affirmed that are worried about this population of patients.

**Conclusions**

Bariatric procedures are increasing and this results in an increase number of bariatric patients admitted in ED for AAP. ES has a crucial role in the management of this special group of patients. This WSES web survey was carried out with the aim of showing the current management of bariatric patients in ED by ES. Often early surgical exploration is needed in the first 12 hours to have good outcomes and reduce morbidity.
ABSTRACT: The purpose of this paper is to present our experience in the treatment of peripheral vascular lesions in a secondary provincial hospital in Zakynthos as well as the application of a way of <<damage control>> to vascular lesions. Early (up to about 6 hours) treatment-rehabilitation of vascular lesions, especially arterial disease, is a major contributor to avoiding severe and permanent lesions (ischemia, necrosis, reperfusion syndrome etc). In absence of a definitive restoration of a potentially severe vascular lesion (tissue deficiency, lack of implant or vascular surgeon etc) placement of a temporary tube-Nelaton as intrarterial stent is a simple and easy method that, unlike ligation, can save a human arm (brachial artery) a life (carotid trauma) offering the necessary time to move safely to a tertiary hospital for definitive repair of the damage.
MINIMALLY INVASIVE SURGERY: PERCUTANEOUS APPROACHES IN THE ACUTE CARE SURGERY SETTING
Botache, W; Sanjuan, J; Medina, R; Montero, N; Rojas, LA; Villamil, ES; Tafur, D.

COLOMBIA

Introduction: Minimally invasive surgery substitute open procedures and highly invasive surgeries, which requires the upgrading of surgical instruments and techniques. Most of these ultrasound-guided percutaneous procedures are a safe and feasible alternative to surgery in the acute care setting. Surgeons ability to determine and perform the least invasive treatment appropriate for their condition reduces risk pursuing better outcomes, remarking the image-guided percutaneous intervention as tool need for this century surgery practice. We aimed to describe our experience in percutaneous approaches in the acute care surgery setting.

Methods: we performed a one year [2017] retrospective cohort analysis of interventional procedure in the minimally invasive surgery department in a level I academic center in the Southern of Colombia. We employed absolute and relative frequencies to summarize categorical variables, and median with the inter quartiles range [IQR] for continuous variables.

Results: a total of 134 procedures were found, patients median age was 57 years [IQR= 44-75 years] and 64 patients were male [47.8%]. Most frequent performed procedures were 39 Pleural drainages [29.1%], Paracentesis in 24 cases [17.9%] and Vascular access in 24 cases [14.9%]. Most frequent anatomical area intervened was Thorax in 65 procedures [48.5%], abdomen in 48 cases [35.8%] and head and neck in 18 cases [13.4%].

Conclusions: percutaneous approaches in the acute care surgery setting are feasible, new century surgeons are able to perform Ultrasound-guided percutaneous drainage is a safe and needed alternative to surgery.
Achievement of Small Intestine Preservation through Capsule Endoscopy that Revealed an Absence of Small Intestinal Mucosa Necrosis: A Case Report

Tomohisa SHOKO, TOKYO, JAPAN

Background:
We often encounter ICU inpatients who are suspected to suffer from small intestinal ischemia. If the patients can receive an enhanced multidetector computed tomography (MDCT) examination, it would be possible for us to diagnose full-thickness small intestinal necrosis. However, it is difficult with images alone to diagnose small intestinal mucosa necrosis that does not result in a full-thickness necrosis. We therefore began using capsule endoscopy examination to diagnose small intestinal mucosa necrosis at an early stage in ICU inpatients. By using this capsule endoscopy to diagnose the small intestinal mucosa, we were able to conserve the small intestine in one patient after performing surgery to release a strangulated small intestine. Here, we report our experience with this case.

Case:
This case refers to a 66-year-old woman who was transported to our hospital via ambulance due to chief complaints of strong abdominal pain and back pain. Marked distention of the abdomen was observed and the patient reported a strong abdominal tenderness. We performed enhanced MDCT on this patient and suspected sigmoid colon volvulus and strangulated small intestine necrosis. We subsequently performed an emergency laparotomy to resect the necrotic sigmoid colon volvulus and to release the strangulated small intestine that was approximately two meters in length. The color of the dark red small intestine improved but did not return to its normal color. We elected an open abdominal management as only 60 cm of the small intestine would remain after small intestine resection of this site. We therefore decided to manage the patient at the ICU to improve her general condition and planned another surgery 48 hours later. At the ICU, we advanced the capsule endoscopy to the third portion of the duodenum using fiber endoscopy and observed the small intestinal mucosa. The capsule endoscopy camera reached the colon 10 hours and 30 minutes later, and the results of the examination revealed the absence of small intestinal
mucosa necrosis. On Day 3, we conserved the whole small intestine and closed the abdomen. The patient started oral consumption of food on Day 8 and was discharged on Day 28.

Conclusion:
Capsule endoscopy examination is useful for diagnosing small intestinal mucosa necrosis in ICU inpatients.
Razor blade ingestions: is the non-operative management safe?

Sozzi M, Siboni S, Aiolfi A, Riva CG, Bonavina L, Inaba K
University of Milan Italy

Background: Foreign body ingestion (FBI) is a common problem encountered in the Emergency Department. Approximately 10% to 20% may require an intervention and 1% may need surgical exploration. Although studies with large series of FBI patients have been recently published, there are none that specifically focus on the management of razor blade ingestion. Our hypothesis is that the ingestion of razor blade should be managed non-operatively.

Study design: All patients admitted to a tertiary-care center with a razor blade ingestion over the last five years were retrospectively reviewed. The primary outcomes analyzed were hospital length of stay (HLOS) and clinical outcomes. The study population was stratified according to the treatment (conservative vs. endoscopic).

Results: There were 37 patients who met inclusion criteria. Average age was 29.2 years, 94.6% were male and 86.5% were inmates. A psychiatric disorder was found in 33 patients (89.2%). A significant number of patients (54.1%) had a history of multiple FBI (average ingestion per patients 1.7, range 1-7). The total number of admissions was 64 during the study time frame. All the patients underwent a plain x-ray and 12.5% a CT-scan. The treatment was non-operative in 77.6% and endoscopic in 23.4%. None of the patients required surgery. The median number of chest or abdomen x-rays for each patient was comparable between the two groups. The median hospital length of stay was 3 days in the non-operative group and 3.5 days in the endoscopy group (p= 0.843). No gastrointestinal perforations were observed.

Conclusions: Razor blade ingestions can be safely managed either by endoscopy (if the blade is in the stomach or in the rectum) or by conservative approach. The hospital length of stay seems to be driven by the psychiatric disorder and not by the ingestion.
Osipov AV, Demko AE, Surov DA, Svyatnenko AV

Single stage laparo-endoscopic interventions in treatment of patients with CBD stones.

Scientific research institute of emergency care named after I.I. Dzhanelidze, St. Petersburg, Russia.

At present, the common practice is the tactics of two-stage treatment of patients with obstructive jaundice and acute cholangitis of benign etiology. However, in recent years, there have been increasing reports in the literature about the possibility of a single-stage, minimally invasive treatment, provided that patients are carefully selected, the necessary equipment and trained personnel are available.

Aim: to improve the immediate results of treatment of patients with complicated choledocholithiasis.

Materials and methods. 73 hybrid interventions were implemented between 2014 and 2017. Patients with cholelithiasis, complicated with common bile duct stones (CBDS), obstructive jaundice, and mild cholangitis were included in the groups of patients. When choosing tactics and determining indications for surgery, the criteria proposed by Roger S.J. (2010) were guided: the presence of single concrements in CBD, diameter over 12 mm, the predictable impossibility of performing endoscopic lithoextraction, and the absence of contraindications for laparoscopy.

All interventions were performed in the X-ray operating room using the laparoscopic and endoscopic approaches. The average age of the patients was 59.8 ± 16.7 years. We performed 37 laparoscopic cholecystectomies (LCE) in combination with laparoscopic choledochotomy, choledochoscopy and lithoextraction. 14 patients with paraphathéal diverticula performed a combination of LCE with drainage, cannulation of the CBD and subsequent ERCP and lithoextraction (rendezvous technique). In 22 cases, a single-stage operation included LCE and ERCP.

Results. The average duration of the operative intervention was 94.2 minutes, the length of hospitalization was 9.6 days. In 1 (3.7%) case, residual choledocholithiasis was observed, requiring repeated endoscopic lithoextraction under general anesthesia (type III b according to Clavien-Dindo 2004). In 3.7% of cases, bile leakage occurred without requiring a change in treatment tactics (type I according to Clavien-Dindo 2004). There were no other complications or lethal outcomes. It should also be noted that one-step interventions in patients with special risk groups were effective. Among the performed hybrid interventions - one operation in a woman in 24 week of pregnancy, two in elderly people with severe concomitant pathology.

Thus, hybrid surgical interventions can be used for the simultaneous treatment of patients with complicated CBDS, further experience accumulation and analysis of the results of these interventions are required.
The qSOFA score in assessing severity in acute pancreatitis
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Immanuel Kant Baltic Federal University, Regional Clinical Hospital, Kaliningrad, Russia

Background.
The quick Sequential Organ Failure Assessment (qSOFA) during the first 24 hours of hospitalization is associated with poor outcomes of patients with suspicion of sepsis including acute pancreatitis.

Aim:
To evaluate the role of qSOFA at time of emergency department (ED) presentation in assessing severity in acute pancreatitis (AP).

Methods.
Retrospective analysis of all patients admitted directly through ED in 2015-2017 with AP. The incidence of positive qSOFA (≥2 of the following: systolic BP ≤100 mmHg, respiratory rate ≥22 breaths/min, altered mental status or GCS <15) using ED triage data were evaluated with individual markers of severity (pancreatic necrosis and persistent organ failure [POF]) and outcomes (length of stay [LOS], need for intensive care unit [ICU], and mortality).

Results.
A total of 240 patients were analyzed. At time of ED presentation, qSOFA was positive in 12 patients (5,0%). There were 30 (12,5%) cases of pancreatic necrosis, 38 (15,8%) POF, 47 (19,6%) requiring ICU, and 13 (5,4%) deaths. Compared to negative qSOFA, a positive qSOFA score at presentation was associated with higher rates of POF (83,3% vs. 6,4%, p<0,001), longer LOS (18 days, [IQR 5-66] vs. 4 days, [3-7]; p<0,004), increased need for ICU (91,7% vs. 8,2%; p<0,001), death (50,0% vs. 3,1%; p<0,001), and pancreatic necrosis (83,3% vs. 7,3%; p<0,001). Severe AP according to the Revised Classification of Atlanta was detected in 10 patients with a positive qSOFA (83,3%). Moderate acute pancreatitis was detected in 2 patients with AP and positive qSOFA (16,7%). In all cases of mild acute pancreatitis, a negative qSOFA was determined.

Conclusion.
At time of presentation for acute pancreatitis, the presence a positive qSOFA score are associated with increased severity in AP and poor outcomes.
Spontaneous Small Bowel Perforation: a devastating intraabdominal condition

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¹ 3rd Department of Surgery, National and Kapodistrian University of Athens, Medical School, Athens, Greece
² 1st Department of Surgery, National and Kapodistrian University of Athens, Medical School, Athens, Greece
³ 2nd Department of Surgery, National and Kapodistrian University of Athens, Medical School, Athens, Greece

Purpose: Spontaneous small bowel perforation is a relatively rare but extremely dangerous clinical entity with high perioperative mortality requiring urgent surgical treatment. The aim of the study is to present the treatment of small intestinal perforation in our Institution, focusing on diagnosis and lesion detection, optimal surgical treatment and postoperative management.

Method: This study is a retrospective study of the patients operated on in three University Surgical Departments during the period 2006-2017 with spontaneous perforation of the small intestine. We evaluated the medical history, diagnostic modalities, surgical treatment and postoperative course.

Results: A total number of 59 patients were identified (29 men, 30 women), with a mean age of 66.9 years (18-96). The majority of patients had acute abdomen on presentation, with/without signs of incomplete intestinal obstruction. Diagnosis was established mostly by radiological imaging; in 46 patients (77.9%) diagnosis was established with computer tomography. Ileum was the predominant site of perforation (53.3%), followed by the jejunum (36.7%), while 3 patients had multiple perforations. The most common cause of perforation was mesenteric ischemia, which was observed in 23 patients (38.9%). Other common surgical findings were non-Hodgkin lymphoma of the intestine and peritoneal carcinomatosis. Interestingly, in 41% of patients the cause of perforation could not be found. In 43 patients the damaged bowel segment was resected (72.9%), whereas in 15 patients primary closure of the perforation site was done; in one patient with perforation of terminal ileum a right hemicolectomy was performed. In 40 patients a primary anastomosis was performed, whereas in 9 patients (16.3%) a prophylactic loop ileostomy was carried out. Postoperative morbidity was high (64.4%) with septic shock and electrolyte derangement being the most common and severe postoperative complications. The overall postoperative survival was 52.2%.

Conclusion: Small bowel perforation is an acute surgical entity requiring immediate treatment. Both perioperative and postoperative mortality rates are extremely high, due to the associated peritonitis and sepsis. Early recognition and prompt surgical management may save the patient’s life.
The development and validation of a WSES surgery G20 comprehensive gallbladder score. A prospective collaborative study.
Michael Sugrue, Cathy Barrett Federico Coccolini\(^*\) Magda Bucholc\(^*\) World Society Emergency Surgery.

Letterkenny University Hospital, Donegal Clinical Research Academy Ireland, \(^*\)Papa Giovanni Hospital Bergamo Italy, \(^*\) Ulster University Interreg SEUBP Derry-Londonderry UK

**Introduction:**
Laparoscopic cholecystectomy is one of the commonest operations in surgery. Only recently have operative scoring systems, (Sugrue, Parkland and AAST) have been defined. Each score classification brings new concepts, and may provide a template for benchmarking and future research.
This study describes and will evaluate a new G20 score encompassing all sectors of the clinical care process.

**Methods:**
A prospective, web based, ethically approved, study would be established by WSES and the emergency surgery advancement project of Interreg at Letterkenny University Hospital with a new 20 point score system (Table 1). Surgeons around the world will be asked to enrol patients in a de-identified web based platform between September 2018 and 2019 aiming to enrol 500 patients. Using odds ratios, multivariate analysis and ROC curves, factors associated with specific outcome will be identified. The operative procedure, use of cholangiography, and conversion to open surgery and complications will be recorded.

**Table 1 G20 Score**

<table>
<thead>
<tr>
<th>History</th>
<th>Previous admission with Cholecystitis</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous ERCP</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>ASA ≥3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>BMI&gt;30</td>
<td>1</td>
</tr>
<tr>
<td>Physical</td>
<td>T&gt;38</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>P&gt;100/m</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Guarding RUQ (separate from Murphy’s sign)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Mass RUQ</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Lower abdominal peritonism</td>
<td>1</td>
</tr>
<tr>
<td>Laboratory</td>
<td>WCC&gt;15000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>CRP&gt; 50</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Amylase&gt;300</td>
<td>1</td>
</tr>
<tr>
<td>Imaging</td>
<td>GB Wall &gt;4mm</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pericholecystitic fluid</td>
<td>1</td>
</tr>
<tr>
<td>Operative</td>
<td>GB Completely Buried</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Adhesions from previous surgery limiting access</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Distended/Shrvelled or GB stone &gt;1cm impacted in neck</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Gallbladder weight &gt;30gm</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Free fluid in peritoneal cavity</td>
<td>1</td>
</tr>
<tr>
<td>Pathology</td>
<td>Gangrenous GB histologically</td>
<td>1</td>
</tr>
</tbody>
</table>

**Conclusion:** This study will provide a comprehensive overview of the value of key aspects of care in predicting outcomes and complications in patient admitted with cholecystitis.
Michael Sugrue, Federico Coccolini^ Magda Bucholc* and 61 contributors from WSES.

Letterkenny University Hospital, Donegal Clinical Research Academy Ireland,^ Papa Giovanni Hospital Bergamo Italy,* Ulster University Derry-Londonderry UK Interreg

Introduction:
Laparoscopic cholecystectomy has inconsistent outcomes and conversion rates, in part related to variable operative findings. An operative scoring system described in 2015 was modified creating a new Gallbladder operative score (G10). This study assessed the G10 score’s ability to predict need for conversion to open cholecystectomy.

Methods:
A prospective, web based, ethically approved, study was established by WSES with a 10 point score system (Table 1) enrolling patients undergoing laparoscopic cholecystectomy between January 2016 and December 2017. The operative procedure, use of cholangiography, and conversion were recorded.

<table>
<thead>
<tr>
<th>Table 1 G10 Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesions covering &lt;50% of GB</td>
</tr>
<tr>
<td>Adhesions &gt;50% but Gallbladder visible</td>
</tr>
<tr>
<td>Completely buried GB</td>
</tr>
<tr>
<td>BMI &gt; 30</td>
</tr>
<tr>
<td>Adhesions from previous surgery limiting access</td>
</tr>
<tr>
<td>Distended or shrivelled GB</td>
</tr>
<tr>
<td>Inability to grasp GB</td>
</tr>
<tr>
<td>Stone ≥ 1cm impacted in Hartman’s pouch</td>
</tr>
<tr>
<td>Bile or Pus outside GB</td>
</tr>
<tr>
<td>Fistula</td>
</tr>
<tr>
<td>Total possible score =10</td>
</tr>
</tbody>
</table>

Results:
504 patients, mean age 53.5 (range 18-89), were enrolled by 61 surgeons in 16 countries. Surgery was performed by consultants in 70% elective in (56%) mean operative time 78.7min (range 15-400). Operative cholangiograms were performed in 68/504(13%). Prior ERCP was performed in 79/504 16%. The mean G10 score was 3.21, 2.98 in those completed laparoscopically, and 4.65 in the 71/504 (14%) converted. (p=5.274e-10 p<.0001; AUC (95% CI) was 0.763 (0.707, 0.819). Conversion occurred in 33%of patients with G10 scores of ≥5. 5 variables; GB appearance - completely buried GB; adhesions from previous surgery limiting access; impacted stone; bile or pus outside GB; and fistula were statistically predictive of conversion.

Conclusion:
This study identified that higher G10 operative classification scores are associated with significantly increased conversion risk. Broader adaptation and validation may provide a benchmark to improve care in cholecystitis.
Management of American Association for the Surgery of Trauma (AAST) grade III blunt splenic injury without blush: proposal of a Delphi method based study

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Background
High quality evidence for optimal management of splenic injury is unavailable to date [1]. State of the art guidelines for the management of splenic injury rely on lower than optimal quality evidence [2, 3]. While up to date expert based recommendations represent valuable guidance [4, 5] for clinical practice, some aspects of everyday management do not meet consensus. AAST grading and presence of blush on contrast enhanced computerised tomography (CT) play an important role in planning the management of splenic injuries. Management of CT blush positive injuries [6] and grade IV-V injuries with or without CT blush [7] are generally agreed upon. The management of CT blush negative AAST grade III blunt splenic injuries is controversial [4] and can be further confounded by factors like patient demographics, associated injuries, presence of haemoperitoneum, co-morbidities and overall injury severity [8]. The thorough adherence to the efficient application of the Delphi methodology [9, 10] has proven the ability to guide practice [11, 12]. We aim to enhance effective decision-making in the management of grade III blunt splenic injury without blush, in order to optimise clinical outcomes.

Proposed Methods
The suggested approach is a group facilitation technique designed to transform opinion into group consensus though an iterative multistage process. We propose to use this technique with the endorsement of the World Society of Emergency Surgery, providing selected members of the society with an online questionnaire targeted to relevant clinical scenarios. Questions will be focused on treatment strategies (splenectomy, splenic salvage procedure, non-operative management, utilisation of angio-embolisation etc). Participants will be asked to answer the questions assuming that all required facilities for the different therapeutic strategies were at one’s disposal (i.e., adequate clinical setting, angiography suite availability, experienced staff availability). Reminders will be sent to non-responders on a regular basis, with a maximum of two reminders per person. This method allows for the responses to be analysed and communicated back to the experts in a subsequent round to give participants a possibility to re-evaluate their views in the light of others opinions. The process has been validated for systematically assessing and organizing expert opinion [13] and allows anonymous, non-biased consensus building.
Damage Control Surgery for Perforated Diverticulitis with Generalized Peritonitis: Better a Delayed Anastomosis than a Stoma Right Away.

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ABSTRACT

Introduction. In the last decade, Damage Control Surgery (DCS) has been emerging as a feasible alternative management of patients with abdominal infection and sepsis. So far, there is no consensus about the role of DCS in perforated acute diverticulitis. In this study, we present the outcome from a multi-institutional series of patients presenting with grade III and IV Hinchey’s diverticulitis and managed by DCS.

Method. All the participating centers were tertiary referral hospitals. A total of 34 patients with perforated diverticulitis treated with DCS and admitted between June 2015 and September 2017 were included in the study. During the first laparotomy, a limited resection of the diseased segment followed by a lavage and the application of an open abdomen technique was performed. After patient resuscitation, a second look was performed after 24/48 hours. Demographics, clinical, intra-operative and post-operative variables were carefully analyzed. Mortality, morbidity, and restoration of bowel continuity were the major outcomes of the study.

Results. There were 15 male (44%) and 19 female (56%) with a mean age of 66.9 years (SD ± 12.7). Mean BMI was 28.42 Kg/m² (SD ± 3.33). Based on the severity of the disease, 13 cases (38%) were classified as Wasvary’s modified Hinchey’s stage III, and 21 cases (62%) as Hinchey IV. Mean Mannheim Peritonitis Index (MPI) was 25.12 (SD ± 6.28). In 22 (65%), ASA score was ≥ grade III. In all cases, the open abdomen was created by using a Negative Pressure Wound Therapy (NPWT) technique. At the second operation, twenty-four patients (71%) had a primary anastomosis, while 10 (29%) were treated with an end colostomy (Hartmann’s procedure). In 7/34 (21%) cases, a third look was needed. In 2/24 patients, a temporary loop ileostomy was required: both of them were closed in a second moment. Mortality rate was 12%. Overall morbidity rate was 53% (18/34). According to Claviend and Dindo classification, there were no grade I, 6/18 grade II, 1/18 grade IIIa, 5/18 grade IIIb and 2/18 grade IV. Reinterventions were required in 4/34 (12%): two for intestinal anastomosis dehiscence and two for abdominal wound dehiscence. Mean length of hospital stay was 21.9 days.

Conclusion. DCS is feasible for patients with generalized peritonitis from perforated diverticulitis and it seems related to a higher rate of bowel reconstruction. Due to the open abdomen, it requires a stay in ICU with a prolonged mechanical ventilation but these same needs are often the burden of the majority of patients undergone surgery for a perforated diverticulitis, whatever the procedure is done.

KEYWORDS: Complicated Diverticulitis, Damage Control Surgery, Observational Study
The Open Abdomen for the Management of Critically Ill Patients with Abdominal Sepsis: Safe? Yes! Effective? Perhaps!

Authors
Dario Tartaglia MD, Jacopo Nicolò Marin, Rita Fantacci MD, Luigi Cobuccio MD, Serena Musetti MD, Lorenzo Piccini MD, Camilla Cremonini MD, Andrea Bertolucci MD, Ismail Cengeli, MD, Giuseppe Zocco, MD, Christian Galatioto MD, Massimo Chiarugi MD

Emergency Surgery Unit, University of Pisa, Pisa, Italy

Background
The use of Open Abdomen (OA) has been increasingly adopted in the last years to manage patients with severe abdominal sepsis. Several techniques for temporary abdominal closure (TAC) during OA, such as Negative Pressure Wound Therapy (NPWT), have been proposed. The aim of this study was to analyze the outcomes of patients with intra-abdominal infections treated with OA.

Methods
Ninety-six patients treated with OA for severe secondary peritonitis and/or septic shock from January 2010 to March 2018 were included in the study. Patients demographics with clinical picture and the type of TACs adopted were the independent variables analyzed. Major outcomes were: DFC rate, morbidity, and mortality. Minor outcomes included number of revisions and length of the period with OA.

Results
Patients population included 50 males and 46 females (M : F ratio 1.09:1). Mean age was 66.9 years, mean BMI was 26.3 Kg/m². 89% of patients presented with an ASA score ≥ 3. Mean Mannheim Peritonitis Index (MPI) was 22.7 (SD ± 6.5). With regard the negative pressure systems, this were used in 82 patients (85%) with the following distribution: Barker’s vacuum-pack in 41 patients (43%); NPWT system in 38 (39%) and NPWT with dynamic fascial tension system in 3 (3%). In 14 patients (15%), a skin-closure technique was adopted. Overall, the post-operative complications rate was 73%. According to Clavien and Dindo Classification, 25 patients (45%) presented a grade ≥ III complication (6 grade IIIa; 5 grade IIIb; 8 grade IVa and 6 grade IVb). Entero-atmospheric fistula was observed in 2 patients, one in the group treated with NPWT system and one in the group with Barker’s vacuum-pack. DFC was reached in 82 out 83 patients (99%) who survived the initial operation. In 10 patients (12%), a prosthetic mesh was used. Overall mortality rate was 42%. Mortality rate during OA was 14% (13 patients): for these patients the mean time from the first laparotomy to death was 6 days. Mortality rate after definitive fascial closure was 33% (27 patients) with an interval from DFC to death of 17.2 days. Meanly, the length of OA was 3.1 days and the number of revisions was 1.4.

Conclusion
OA appears to be a safe method to manage critically ill patients with abdominal sepsis. Negative pressure systems for temporary abdominal closure allow to reach a high rate of DFC with a low number of entero-atmospheric fistulas. However, morbidity and mortality remain severe suggesting that randomized studies are needed to prove the effectiveness of OA in severe abdominal sepsis.
Duodenal Dieulafoy’s lesion: a case report

Soldini Gabriele; Pappalardo Vincenzo; Latham Lorenzo; Megna Stefano; Zani Elia; Cestaro Giovanni; Leotta Andrea; Frattini Francesco, Alberio Maria Grazia; Inversini Davide; Palumbo Mara; Ietto Giuseppe; Carcano Giulio. Chirurgia d’Urgenza e dei Trapianti, Ospedale di Circolo di Varese, Università degli studi dell’Insubria

ABSTRACT

Background: Dieulafoy’s lesion (DL) is a rare cause of massive gastrointestinal bleeding. The stomach is the most common site for Dieulafoy’s lesion (71%), but approximately one-third of lesions are extra-gastric, most frequently in the duodenum (15%) followed by the oesophagus and the colon. Endoscopic haemostatic procedures are the gold standard method for diagnosis and treatment in accessible lesions and their success is estimated to be around 90%. The lesions that fail to respond to endoscopic treatment can be managed with angiography and embolization. Unsuccess of endoscopy and embolization occur in about the 5% of cases, for these patients surgery is mandatory.

Case presentation: a 76-year-old man, with past medical history of diabetes mellitus, chronic obliterative arteriopathy, hypertension, was admitted in Intensive Care Unit (ICU) of Ospedale di Circolo (Varese) for melena and decompensated diabetes. Gastroscopy revealed multiple duodenal ulcerations and active bleeding at the second duodenal portion, coming from a dilated and tortuous submucosal vessel (DL); hemostasis was achieved by endoclips placement. Other episodes of melena occurred and a further endoscopy was performed: a blood clot on the DL was found and another endoclip was applied. A third gastroscopy revealed the persistence of bleeding from DL; further clipping and 1:10.000 adrenaline solution were used. As a consequence of haemodynamic instability, the patient underwent Computed Tomography Angiography that showed active spreading of contrast in the second portion of duodenum, subsequent percutaneous embolization was unsuccessful. At last, the patient underwent urgent laparotomy. Intra-abdominal findings were citrine free fluid and abnormal distention of small bowel, duodenal mobilization was achieved with Kocker manoeuvre and duodenotomy was carried out revealing a huge amount of fresh blood and clots. The inspection confirmed the DL as the main source of bleeding, precisely located nearby Water’s ampulla on the medial duodenal wall. Hemostasis was achieved by direct suture of the lesion. Finally a cholecystectomy was performed and a biliary drainage was placed. No delayed abdominal closure was necessary. ICU stay period was 5 days. The patient was discharged in 14th post operative day.

Conclusions: DL is a rare life threatening condition. Usually non operative management with endoscopy and/or percutaneous embolization is safe and effective in most of cases. When conservative approach is unsuccessful, an early access to the operating theatre and a skilled surgeon can be the only life saving option for these critically ill patients.
Background: Some Authors have proposed different predictive factors of severe acute cholecystitis, but generally the results of risk analyses are expressed as odds ratios, which make it difficult to apply in the clinical practice of the acute care surgeon. The severe form of acute cholecystitis should include both gangrenous and phlegmonous cholecystitis, due to their severe clinical course, and cholecystectomy should not be delayed. The aim of this study was to create a nomogram to obtain a graphical tool to compute the probability of having a severe acute cholecystitis.

Methods: This is a retrospective study on 393 patients who underwent emergency cholecystectomy between January 2010 and December 2015 at the Acute Care Surgery Service of the S. Anna University Hospital of Ferrara, Italy. Patients were classified as having a non-severe acute cholecystitis or a severe acute cholecystitis (i.e. gangrenous and phlegmonous) based on the final pathology report. The baseline characteristics, pre-operative signs and abdominal ultrasound (US) findings were assessed with a stepwise multivariate logistic regression analysis to predict the risk of severe acute cholecystitis, and a nomogram was created.

Results: Age as a continuous variable, WBC count ≥12.4x10^3/µl, CRP ≥9.9 mg/dl, presence of US thickening of the gallbladder wall were significantly associated with severe acute cholecystitis at final pathology report. A significantly interaction between the effect of age and CRP was found. Four risk classes were identified based on the nomogram total points.

Conclusions: Patients with a nomogram total point ≥74 should be considered at high risk of severe acute cholecystitis (at 74 total point: sensitivity =78.5%; specificity =78.2%; accuracy =78.3%) and this finding could be useful for surgical planning once confirmed in a prospective study comparing the risk score stratification and clinical outcomes.
Introduction

A stimulating debate exists regarding the pathophysiology, diagnosis, classification and appropriate treatment of Acute Appendicitis. In particular, a recently exposed theory divides acute appendicitis into two separate entities: the first one (‘Complicated or Complex Acute Appendicitis’ - CAA) progresses rapidly to gangrene and perforation, with early development of complications; the second one (‘Uncomplicated Acute Appendicitis’ - UAA) is characterised by simple inflammation of the appendix coli and does not progress to perforation or gangrene, although surgical treatment might be needed for symptoms control. Several RCTs have demonstrated safety of Non Operative Management (NOM) of UAA; Operative Management (OM) represents the most appropriate treatment for CAA, with the exception of contained intra-abdominal abscess, which is best treated with percutaneous drainage. However, diagnostic heterogeneity is reported and differential diagnosis between CAA and UAA remains challenging. Furthermore, understanding of pathophysiology and natural history of AA is far from being complete. Under these circumstances, it appears sensible to imply that the decision to commence NOM as opposed to surgical management should be based on severity classification of the disease; a stratified treatment protocol and serial clinical - biochemical reviews of the patient in case of NOM might represent an innovative management philosophy.

Methods and Analysis

During the study period, estimated in a 1-year period plus follow-up period, the cohort of patients will be assigned to three groups of treatment - NOM, OM or Percutaneous Drainage. All participants will be assessed during hospital admissions and during ambulatory appointments at 1-week, 1-month and 1-year from discharge; an interactive electronic follow-up method will be implemented and will be focused on patient-related endpoints, such as Quality of Life indicators and socio-economic information.

Eligibility:

Eligible patients with AIR of 5 and above will be included in the study. Serious comorbidities, which preclude safety of NOM; clinical suspicion of IBD or malignancy; documented allergy to the antibiotic regimen used in the study; immunocompromise; findings different from Acute Appendicitis at imaging/interventions performed according to the indications of the protocol will all lead to exclusion.

Interventions:

A Stepwise Approach To Acute Appendicitis is proposed; classification of the disease and severity classification (CAA versus UAA) and staged re-evaluation of the patients will guide the indication to NOM, drainage of appendiceal abscess or OM and will be based on the SATA Study Protocol.

Outcomes:

The primary outcome is defined as the rate of complications at 1-year follow-up, classified with the Clavien-Dindo system. The secondary outcomes are defined as follows: Surgery-related endpoints (rate of CAA within the OM group and rate of missed CAA within the NOM group, rate of Negative Appendectomy, operative time, postoperative complications and surgery-related endpoints comparing immediate and delayed surgery ); NOM-related endpoints (rate of recurrence within 1 year after initial NOM, complications related to antibiotic regimen); patient-related endpoint (Quality of Life indicators, days of abscence from work, episodes of abdominal pain)

Ethics and dissemination

The current study will be conducted with respect of the participating patients and of the Declaration of Helsinki. Approval of the Local Ethics Commission will be required as appropriate.
Iatrogenic Lesion of Aberrant Obturator Artery in Surprising De Garengeot Hernia.

Case Report.

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KEYWORDS: De Garengeot hernia, femoral hernia, aberrant obturatory artery, Amyand hernia, Littre hernia and Maydl hernia.

ABSTRACT

Introduction: De Garengeot hernia is rare. Although previous reports have suggested various surgical approach according to patient condition, comorbidities, surgeon preference, hospital innovations’ possibility, and clinical findings during surgery, a treatment strategy has not been established.

Presentation of case: A 75-year-old female was admitted in emergency at our Surgical Department for strangulated femoral hernia within the hernia sac a partly necrotic vermiform appendix. The patient successfully underwent an open appendicectomy and repair of femoral hernia with self fixating mesh (Bard Adhesix). During this procedure a iatrogenic lesion of a right aberrant obturatory artery has done and immediately controlled through the same open incision. The post-operative period was uneventfull, with no further issues at follow up. Histopathological examination confirmed the diagnosis of flegmonosous and haemorrhagic vermiform appendix.
**Discussion:** We suggest that the approach through the transverse subinguinal Nyhus's incision in both appendectomy and herniorrhaphy in cases of *De Garengeot* hernia furthermore with likely presence of anatomic anomalies. *De Garengeot* hernia is often only made intra-operatively due to its irregular clinical presentation and it must be differentiated from: *Amyand* hernia, *Littre* hernia and *Maydl* hernia.

**Conclusions:** This is a rare case of dual pathology with also an aberrant artery anomalous anatomic condition found in less of 30 % of cases.
Laparoscopic treatment of bowel intussusception due to ileo-cecal localization of endometriosis. A report of 2 cases.

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INTRODUCTION: Endometriosis is a disease affecting 10% to 12% of fertile women, with the number of cases diagnosed peaking between the ages of 29 to 39 years. The lesions are typically located in the pelvis but can occur at multiple sites including the bowel, diaphragm, and pleural cavity.

CASE REPORT 1: A 45-years old woman with clinical history of endometriosis was admitted to our ED for abdominal pain and vomiting in a clinical picture of intestinal subocclusion. Laboratory tests revealed a leukocytosis with raised C-protein. A contrast enhanced Abdomen CT scan and MRI revealed the presence of a nodule involving ileocecal valve, causing bowel distension and obstruction. Furthermore a previous colonoscopy had shown an intraluminal pathological nodule at the ileo-cecal valve. Histology confirmed bowel localization of endometriosis. The patient underwent a laparoscopy showing bowel intussusception due to endometriotic ileo-cecal localization. A laparoscopic right colectomy with intracorporeal anastomosis was performed and the patient was discharged after an uneventful course on POD 6.

CASE REPORT 2: A 38-years old woman with past clinical history of previous open and laparoscopic interventions for endometriosis was admitted to our ED complaining of lower right quadrant abdominal pain and nausea in a clinical picture mimicking an acute appendicitis. On physical examination she presented rebound tenderness at right iliac fossa. Laboratory tests revealed a leukocytosis (12000 mmc) and raised C-protein (113 mg/dl). CT scan with i.v. contrast media was performed, revealing a 5 cm mass close to last intestinal loop and cecum causing bowel obstruction. The patient underwent laparoscopy, showing a bowel intussusception due to endometriotic ileo-cecal localization and an appendicular abscess tightly adherent to the abdominal wall. A laparoscopic right colectomy was performed and the patient was discharged after an uneventful course on POD 7.

CONCLUSION: Endometriosis should be always considered in the differential diagnosis of intestinal obstruction in fertile women.

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INTRODUCTION: Diverticular disease is widespread in Western countries due to diet and lifestyle. Diverticular perforation with abscess formation is a common complication of diverticulitis and, if untreated or misdiagnosed may lead to several degrees of morbidity.

CASE REPORT: A 48 year-old male patient, BMI 43, presented in the ED with left lower abdominal pain, vomiting and slight fever for 3 days. On P.E. he showed rebound tenderness on left iliac fossa. Neutrophil leucocytosis (21000 mm3/c) and raised PCR (201 mg/dl) were present. Intravenous and endoluminal contrast enhanced CT revealed the presence of a large retroperitoneal fluid and gas collection, due to diverticular perforation, extended from pelvis to iliac bifurcation, involving the left urether. No hydro soluble contrast media leakage or massive pneumoperitoneum were present. After an initial conservative treatment without significant improvement an emergency laparoscopic left colectomy with primary anastomosis and laparoscopic retroperitoneal collection drainage was performed. The laparoscopic approach was very challenging due to the obesity of the patient and the presence of the abscess. The patient was discharged on POD 12 after requiring re-intervention for dehiscence of the left iliac mini-laparotomy on POD 7.

CONCLUSION: Diverticular perforation in obese patients adds a further challenge to its laparoscopic treatment and deserves an aggressive surgical approach since its outbreak.

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Case report: Abdominal emergency surgery due to anabolic-androgenic steroid self-prescription (abuse)

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Abstract. Background. For the purpose to increase lean body mass, to achieve higher levels of sports performance and also for aesthetic purposes the abuse of exogenous anabolic-androgenic steroids (AAS) has increased enormously in the last decade. The possibility of self-prescribing AAS is also a consequence of wide availability of AAS, all types of other drugs and exogenous substances in the free market and uncontrolled production and quality. Active substances per se and even more, carriers of substances are responsible for a wide range of toxic effects triggered after certain dose i.e. biological effects and toxicity. Hazards to several side effects of exogenous AAS abuse are described; acute abdominal surgical emergency due to massive bleeding from liver adenoma is a life-threatening complication requesting intensive medical treatment and prompt surgical approach. Case presentation. 47y old man presented to regional hospital of upper abdominal pain with US and CT evaluation to left liver abscess, segments II and III, with the diameter of 9,5x7 cm. Transferred to refereral tertiary center repeated US and CT angiography confirmed previous radiological description. Directed laboratory screening based on clinical presentation of jaundice, restlessness, insomnia and oliguria confirmed hepato-renal syndrome. Intensive and forced medical history was positive to AAS abuse in the circumstances of mild physical activity: oral Turina Bol, Sustamet and Nadrolond injections were self-administered after being ordered from free internet market. After initial slight bleeding but negative for urgent CT guided angiography, day 4 after admission, a massive left lobe liver bleeding occurred requested prompt laparoscopy with left liver lobe resection and massive haemostasis. Massive transfusion and intensive care treatment was the only treatment modality.

Conclusion. Clinical circumstances require directed and forced medical history in any clinical suspicion to drug abuse to treat life-threatening complications of side effects and concomitant toxicity. Intensive and prompt diagnostic approach is needed to avoid short and long-term complications. All preventive measures and new diagnostic procedures are mandatory to prevent drug abuse (AAS, others) in professional and recreational sport practising population. Any measure to supervise production of substances and impede the free market should be speeded up to reduce short and long-term side effects of drug abuse and enormously high costs of treatment for acute and long-term consequences of drug abuse.

Key words. Bleeding, liver adenoma, urgent surgery, anabolic-androgenic steroid abuse, free drug market.
Critical View of Safety during Laparoscopic Cholecystectomy in acute cholecystitis.

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Background. Implemented in elective surgery critical view of safety (CVS) helps to avoid biliary injury during laparoscopic cholecystectomy (LCE). Weather it is possible to achieve this principle in emergency setting was the goal of this work.

Methode. Retrospective analysis performed for all cases of cholecystectomy during 2017, where in all cases of acute cholecystitis attempts to achieve CVS were performed.

Results and discussion.

The authors have studied 90 cases of patients with acute cholecystitis, who underwent laparoscopic cholecystectomy, 64 of them were women (71%) and 26 men (29%). The mean age was F 62 yrs. [35 - 81] and M 58.5 yrs. [16 — 85] respectively. Duration of the disease ranged from several hours to 13 days. Mean time from admission to surgery was 2.1 days. The duration of the operation in women was 44.8 min., and 52.7 min. for men, and hospital stay 9.5 and 11.8 days respectively. In 3 cases (3.53%) cholecystitis was non-calculous. Morphologically, the following division was observed: catarrhal 5 (5.9%), phlegmonous 44 (51.7%), gangrenous 36 (42.4%). Perforation of the bladder was found in 3 (3.53%) patients, and a perivesical abscess in 4 (4.71%). The difference in the duration of the operation with gangrenous and phlegmonous cholecystitis was found to be statistically not significant (Mann-Whitney test in the zone of uncertainty). Draining with polyvinylchloride tube was performed in 40 (47%) patients. There were no cases of biliary injury during the study period. Conversion to open cholecystectomy was performed in 5 (5.6%) patients and the main reason for conversion was the difficulty of dissection in the triangle of Calot.

Due to difficult visualization and inflammatory changes of tissues, the danger of damaging the bile ducts and vessels is quite high. We apply the following method to ease dissection. Electrosurgical hook is used only to cut the peritoneum. Further dissection proceeds bluntly with the small gauze ball, gripped with a grasper. This technique is simple, it doesn’t require additional tools and allows to achieve all points of the critical view of safety. Retrograde mobilization of the gallbladder, as a rule, did not ease the dissection in Calot’s triangle. This variant is more acceptable for performing partial cholecystectomy, when dissection in Calot’s triangle is recognized as impossible. We use this technique also for dissection of the gallbladder from its bed. We did not observe any complications associated with this technique. According to our data, a dense infiltrate and the need for sharp dissection should be regarded as signs, indicating that it is impossible to achieve the principles of safe cholecystectomy, and should be considered as indication for conversion to an open surgery, or to call a more experienced colleague. It was noticed, that necrosis and tearing of the gallbladder wall, perivesical abscess, perforation of the gallbladder, large wedged stone in the Hartmann’s pouch lengthen operation, but did not cause any extra difficulties during cholecystectomy.

Conclusion:
1. CVS is achievable during LCE in acute cholecystitis.
2. Blunt dissection with the gauze ball, gripped with the grasper is safe and effective technique of dissection.
Management of appendicitis in children and adults: results of the French prospective multicentric study APPEA

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**Introduction:** Acute appendicitis still represents a surgical challenge because of its frequency, the involvement of mainly young and active subjects, its semiological polymorphism and its potential gravity. Surgeons' awareness of the early and late complications of appendectomies, national recommendations for good practice, and improvements in the quality and accessibility of emergency imaging have certainly contributed to the decrease in unnecessary appendectomies. The exact modalities of this profound change in practices have so far been poorly studied. The objective of this study was to gather in a comprehensive way, surgical practices to improve the management and follow-up of patients with appendicitis in France.

**Patients and Methods:** This is a multicentric national prospective survey that includes children and adults in France with acute appendicitis between March 1st and June 30th, 2017. The data was collected using an electronic case report form after consenting the patients or their parents, by surgeons members of the French Association of Surgery (AFC). These data included demographic characteristics, medical history, symptoms, biology, radiology, and treatments performed during hospitalization, the modalities of the intervention and any complications across a follow-up of 6 months.

**Results:** A total of 2285 electronic files were opened, 19 patients were excluded for insufficient data. The 2266 patients in the study were included by 131 surgeons. There was a slight male predominance (57%), and 1025 patients (45%) were under 18 years of age. There was a peak frequency between 10 and 20 years. The main reasons for consultation beside abdominal pain (98%) were digestive disorders (60%), significantly more present in the 0-3 age group. The classic symptom presentation showing pain, fever and leukocytosis was present in only 17% of patients. Non-operative treatment with exclusive antibiotic therapy was decided for 4% of patients, in 88% of cases in front of a clinical and / or radiological mass. In the laparoscopic group, the 3-trocar technique was performed for the vast majority of patients (91%) with ligation of the appendicular basis by a preformed loop (87%) and removal of the appendix in a bag (88%), without drainage in 85% of cases. The 45-day post-operative mortality was 3 cases (0.13%), the severe complications (Clavien-Dindo grade III or IV) were 1.5% and the loco-regional complications (superficial and deep abscess) were 3.7%. Mean hospital stay was 3.7 days, depending significantly on age. Pathological examination was available in 75% of the cases, with discovery of a tumor in 1.2% of cases. An appendix considered normal histologically was only found in 4.6% of cases.

**Discussion:** The high participation of general and pediatric surgeons allowed the inclusion of nearly 10% of all the appendectomies performed in France during the inclusion period. A generalization of practices has been demonstrated, with the use of almost systematic imaging and standardization of surgical techniques. Exclusive antibiotic therapy is infrequent and reserved for inflammatory appendiceal mass. The average hospital stay can probably be decreased for a selected population.
Significant positive fluid balance at post-operative day 1 is an independent risk factor for early death in emergency surgery.

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INTRODUCTION:
In emergency surgery early post-operative death (EPOD) is a common event usually as a result of multi-organ failure. In addition significant amount of body fluid retained following surgery might also be related. However such association has yet to be established. We postulated that significant positive fluid balance during first few days of surgery is related to EPOD.

METHODS:
All patients who died following surgery in 2017 at Kuala Krai Hospital, Malaysia were reviewed. Their files were retrieved for analysis. Early post operative death (EPOD) is defined as death within 72 hours of surgery. Apart from demographic data, parameters analyzed were SOFA score for renal, lung and cardiac for three consecutive days of surgery (POD1 - POD3) and at post operative day 7 (POD 7). Amount of fluid balance for each post-operative day was calculated in ml/kg/hour. A multi-variable stepwise logistic regression was used to examine its correlation.

RESULTS:
Out of 355 emergency surgeries done in 2017, 26 deaths were identified (0.07%). Incidence of early and late death were 57% (n=15) and 42% (n=11) respectively. Their mean age (55.6 ± 20.6 vs 60.2 ± 10.6 ;p= 0.485) , ASA (3.2 ± 0.79 vs 3.0 ± 0.83; p=0.572), Charlson comorbidity index ( 3.6 ± 2.66 vs 4.0 ± 1.64; p= 0.63) and predicted POSSUM mortality ( 38.4% ± 24.36 vs 47.6% ± 27.47; p= 0.365) were not statistically significant respectively. Most (n=23; 88%) were sepsis related diagnosed as complicated intra-abdominal sepsis (n=13) and complicated soft tissue infection (n=10) respectively. Significant parameters which statistically significant on univariate analysis were mean SOFA lung at POD 1 (1.6 ± 1.29 vs 0.4 ±0.68; p=0.009), SOFA cardiac at POD 1 (3.4 ± 1.40 vs 2.0 ± 1.78; p= 0.028), total SOFA at POD 1 (10 ± 4.67 vs 6.0 ± 4.07; p=0.032) and fluid balance at POD 1 (2.6 ± 2.16 vs 0.6 ± 0.51; p= 0.005) respectively. Stepwise logistic regression analysis showed only fluid balance at POD 1 is significantly associated with early post-operative death (p=0.021, OR:3.4, 95% CI: 1.2 – 9.7) with excellent discriminatory ability (AUROC of 0.806; p=0.009, 95% CI: 0.624 – 0.988). Further analysis indicates positive fluid balance of ≥ 0.81 ml/kg/hour at POD 1 has sensitivity, specificity, positive predictive value and negative predictive value of 80%, 72%, 80% and 72.7% for early death respectively (p= 0.007).

CONCLUSION:
Perioperative fluid therapy has to be meticulously monitored as significant positive balance at POD 1 will increased risk of early death significantly.
Title: Unplanned return to theatre following general surgery operations: Learning missed?

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Aim: Unplanned return to theatre is a recognised adverse event reflecting on the quality of surgical care. The reported outcomes however, vary significantly in the literature with limited evidence on standardisation. We report on our experience of all unplanned return to theatre following scheduled and unscheduled general surgical procedures.

Methods: All consecutive unplanned return to theatres within thirty days following the index general surgical procedure were included over a 24-month study period (08/2015-08/2017) in a United Kingdom-based small district general hospital. The index procedures included elective (day case and in-patient) and emergency general surgical procedures (colorectal, upper GI, breast, and endocrine). Data was collected from ORMIS (Operating Room Management Information System) and further clinical details relevant to the scope of our study were reviewed through assessment of the case notes. Patient demographics, ASA score and co-morbidities were analysed.

Results: 27 patients over the 2-year study period-required emergency reoperation; 20 of the case notes being retrievable for clinical review. Male-to-female ratio was 14:6; age range was 42-88 years with a mean ASA of three. The index surgical procedure was a scheduled operation in 11 with nine being unscheduled. 20% of the patients required more than one emergency reoperations and the unadjusted mortality rate was 10%. In 95.5% of the reoperated cases, the first operation was performed by or under the supervision of a Consultant Surgeon. Subgroup analysis of findings observed during the reoperations included anastomotic leak (26.1%), wound dehiscence (17.4%), hematoma/active bleeding (17.4%), postoperative wound collection (13%), small bowel obstruction/ischemia (8.7%), small bowel perforation (8.7%), iatrogenic urinary tract injury (4.3%), recurrence of abdominal wall hernia (4.3%), and at least half of these could be avoidable.

Conclusions: The incidence of unplanned return to theatre is often underestimated and constitutes a significant burden to our health economics. Utilising validated and standardised reporting methodologies in conjunction with large-scale data collection and analysis may pave the way for improving the quality of surgical care and minimise the harm to the patients following elective and emergency surgery.

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Application of the method of negative pressure therapy in the complex treatment of patients with severe sepsis and septic shock.

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Actuality

Sepsis remains an urgent problem of modern medicine, due to the high mortality and increasing in morbidity. The main causes of surgical sepsis are: necrotizing soft tissue infections and complicated intraabdominal infections. Necrotizing soft tissue infection is one of the most rapidly progressive infectious process, complicated by severe organ failure. At the same time complicated intraabdominal infection - a diffuse peritonitis, with severe sepsis and septic shock is the primary mortality cause in the surgical units. Even a comprehensive approach to the treatment of these pathologies does not allow to minimize the severity of the disease and significantly reduce the percentage of adverse outcomes, reaching alarming values in 20-50% in advanced clinics.

The use of negative pressure wound therapy in the complex treatment of patients with severe sepsis and septic shock is an actual and promising direction of modern surgery.

Material and methods

On the base of the “Severe sepsis care City centrum” in the Emergency care research Institute. n.a. I. I. Dzhanelidze 32 patients with necrotizing soft tissue infections (NIMT) complicated by severe sepsis and septic shock and 15 patients with complicated forms of intraabdominal infection were treated in 2017.

The diagnosis of severe sepsis and septic shock was based on diagnostic criterias proposed by the conciliatory conference of The American College of pulmonologists and the society of critical medicine - ACCP/SCCM (SEPSIS 1). The severity of the septic process was assessed on the SOFA scale.

NSTI: During the first hour from the moment of admission to the hospital empirical ABT was began mainly carbapenems and protected betalactam, then - target, according to the results of microbiologic research. Surgical debridement of the focus of infection was carried out in the first hours of hospitalization. In the main group NPWT-system was installed 24 hours after the primary surgical debridement of the infectious focus, in the absence of progression of necrotic process and good hemostatic status. NPWT system was operated in intermitted mode with a pressure of 120 and 80 mm Hg. The change of the NPWT system was carried out every 48 hours, and, in case of absence of new necrotic tissues and reduction of organ dysfunction was performed early closure of the wound defect. Patients with NSTI were divided into two representative groups. The main group of the study included patients in the complex treatment of which used vacuum-assisted wound management -13 (40%). The patient’s average age of 57.3+/is 18.4, mens 9 (69%), females 4 (31%) . At the time of the first surgical debridement, the average value were: SIRS=2,5±0,6; SOFA=4,45±3,8.

The control group included patients in the complex treatment of which the classical method of
wound management 19 (60%) was used. The patient’s average age of 57.5+/is 18.4, 9 men (47%), female 10 (53%). At the time of the first surgical debridement SIRS=2.5±0.6 SOFA= 4.8±4.1. Statistically significant differences in demographic indicators, in the severity of patient’s conditions with NSTI on admission in both groups were not revealed (p>0.05).

CIAAI: In our study were included 15 patients with severe forms of diffuse peritonitis. The main group consisted of 8 patients who were treated using the method of NPWT closed laparostomy. The aim of a first laparotomy was to lock the source of infection foci. Programmed relaparotomy with the final volume was performed immediately to stabilize the patient during the first 48 hours. A control group of 7 patients, in complex treatment of which applied the traditional surgical approach with the implementation of the laparotomy, a full volume, along with correction of organ dysfunction intraoperative and subsequent implementation of relaparotomy on-demand.

Both groups are statistically representative. The average age of patients in the main group - 49.4±16.5, in the control-58.9±17.5, in the control group dominated male patients=5 (73.3%) in the main group - men and women were equally. In the main group at the time of the first laparotomy focused on control of the primary nidus of intraabdominal infection average value of the signs of SIRS=2.6±1.0; SOFA=4.1±3.7; MPI =of 22.75+/ -8.5, in the control SIRS 1.4±0.5; SOFA 3.7±2.3; MPI =of 15.7+/ -7.4.

Statistically significant differences in demographic indicators and in the severity of patients’ condition in both groups were absent (p>0.05).

Results

NSTI:

The average duration of hospitalization in the first group (using NPWT) was 30.9±26.9 days, lethal outcome was observed in 3 cases (23%). In the second group the average duration of hospitalization was 39±27.6 days, lethal outcome occurred in 13 cases (68.4%). The number of surgical debridements in the first group was 3.25±2.9, in the second group was 3.16±3.0. Decreasing of organ dysfunction, estimated on the scale of SOFA in the first group occurred for 14.3±16.6 days, in the second for 25.8±18.

cIAAI:

The average duration of hospitalization in the first group (using NPWT) was 67.2±32.2 days, mortality was - 3 cases (37.5%). In the second group, the average duration of hospitalization was 70±65.7 days, mortality was - 2 cases (29%). The number of repeated laparotomies in the first group was 3.6±1.8, in the second group 2.3±0.5. Decreasing of organ dysfunction, estimated on the scale of SOFA in the first group occurred for 10.6+/ -5.7 days, in the second for 19.2+/ -15.1.

Conclusions

NSTI:

1) The use of negative pressure wound therapy significantly reduces mortality in necrotizing soft tissue infections (p<0.05).

2) There was no significant reduction in the time of hospitalization of patients with the use of vacuum-assisted techniques (p>0.05).
3) There is also no statistically significant difference in the number of surgical debridements (p>0.05).

4) SOFA score decreased in the application of negative pressure therapy (p<0.05).

**cIAAI:**

1) The use of negative pressure therapy significantly reduce mortality in severe forms of peritonitis (p<0.05).

2) There was no significant reduction in the time of hospitalization of patients with the use of vacuum-assisted techniques (p>0.05).

3) There was no statistically significant difference in the number of repeated laparotomies (p>0.05).

4) SOFA score decreased in the application of negative pressure therapy (p<0.05).
**Gallstone obstruction of the left colon associated to colonic diverticular stricture: report of a case and review of management.**


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**Case report.** Gallstone ileus of the colon is an extremely rare cause of large bowel obstruction. We report a case of a 76-year-old woman presented to the emergency department with a 3 days history of abdominal crampy pain in the left upper abdominal quadrant, absolute constipation for 5 days without fewer, nausea or vomiting. Known comorbidities were: hypertension, diabetes mellitus and colic diverticulosis. She was emodinamically stable and her abdomen was distended and tympanic with localized pain in the left upper quadrant and right iliac fossa. Contrast radiography revealed the presence of a marked stricture in the proximal sigma and a mobile mass in the descending and trasverse colon. The Computed Tomography (CT) of abdomen and pelvis showed pneumobilia, a gallstone of 5 cm diameter impacted in the proximal sigmoid colon with dilatation of the loops to this point and previous administered contrast within the gallbladder and the colic loops. After 14 hours from admittance the patient underwent one-stage surgical treatment: exploration confirmed bowel occlusion due to a gallstone impacted to diverticular sigmoid stricture with cholecystocolic fistula, a residual stone of 3 cm into the gallbladder and ischemic lesions of the right colon due to overdistention, thus laparotomy, cholecystectomy and subtotal colectomy with end-ileostomy were performed. After the procedure the patient was admitted to intensive care unit ward, on 10th postoperative day was referred to the surgery ward and on 25th postoperative day was discharged. The postoperative course was uneventful. The pathological finding of the specimen confirmed the intraoperative findings.

**Discussion.** Gallstone ileus of the colon accounts for 2-8% of gallstone ileus, about 40 cases are described in worldwide literature. Increasing age, female sex and gallstone larger than 25 mm are known risk factors and patients have pre-existing luminal narrowing usually due to subsequent colonic inflammation as in diverticula disease. In the case presented, endoscopic treatment was not attempted due to the dimension of the stone and the severity of the sigmoid stricture. The surgical management performed, one-stage procedure, has been addressed by the clinical status of the patient (“fit for surgery”), and the intraoperative findings in particular: the residual lithiasis in the gallbladder, the ischemic injuries in the right colon and the presence of the cholecystocolic fistula. Contrast radiography is not mandatory when CT is available, but interestingly it demonstrated the mobility of the gallstone along the colon.

**Conclusion.** There are no recognized management guidelines currently: endoscopy and lithotripsy are advocated as practical first-line non operative strategies in stable patients but surgical treatment is often warranted for definitive treatment and should not be delayed, however minimally invasive timesaving surgery should be considered in frail patients with multiple comorbidities, avoiding bowel resection and associated complications. Laparoscopic management has also been described. A tailored surgical approach is, therefore, the key to successful management.
Title: Blunt abdominal aortic injury – A hybrid approach to combined injuries. A Case report.

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Abstract

Blunt abdominal aortic injury (BAAI) is relatively rare injury, usually a result of seat belt injury in motor vehicle accident (MVA). We report a case of 24-year-old female who was involved in high-kinematics MVA. On presentation she was stable and suffered from seat belt sign and peritonitis. A CT scan showed intimal flap of the infra-renal aorta together with a laceration of jejunum. The patient was operated in hybrid operating room - emergent endovascular repair of the intimal flap with stent deployment immediately followed by explorative laparotomy for jejunal injury. This sequence of steps allowed a clean and efficient repair of potentially lethal aortic injury together with addressing a contaminated injury in the same compartment, hence preventing redundant morbidity. With the advances and growing availability of endovascular therapy, this approach has to be combined into trauma management as add-on to classic therapies.
Intra-abdominal hypertension as an important risk factor in emergency cardiac surgery – preliminary results

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Keywords: intra-abdominal hypertension, acute aortic dissection type A, cardiac surgery

Background

Intra-abdominal pressure measurement is recommended for abdominal surgery and critically ill patients. Increased intra-abdominal pressure is a known risk factor increasing postoperative morbidity and mortality. Intra-abdominal hypertension is associated with gastrointestinal complication, renal failure, reducing cardiac output, elevated intra-cranial pressure and respiration. Aim of this preliminary study was to assess that measuring of intra-abdominal pressure is suitable for clinical practice in emergency cardiac surgery.

Methods

Between December 2016 and February 2018, 18 acute aortic dissection type A-confirmed in computed tomography adult patients were undergoing emergency cardiac surgery in Cardiac Surgery Department of Medical University of Gdańsk, Poland. Postoperatively patients after were admitted to intensive care unit and stayed there over 24h. Apart from general information of patient parameters like duration of surgery, cardiopulmonary bypass use, fluid balance, metabolic and biochemical tests were recorded. Intra-abdominal pressure was measured perioperatively, six hours postoperatively and every twelve hours during three days according to the Krohn technique.

Results

A total of 18 patients (14 men and 4 women, median age was 64 years old) who had undergone median sternotomy for aortic dissection had arterial hypertension in their past medical history. Additionally, one patient had laparotomy because of abdominal aortic aneurysm a few years ago and one of them had moderate kidney failure. Mean Euroscore was 15.06±12.3. All operations were using cardiopulmonary bypass (times ranged from 139 to 333 minutes) and hypothermia with mean temperature 23.5°C ± 3°C. The thirty-day operative mortality was 28%. 10 (56%) of patient had intra-abdominal hypertension and 4 (22%) patients of them had grade II. None of them developed abdominal compartment syndrome.

Seven patients presented clinical signs of complications associated with intraabdominal hypertension: two patients had renal failure, another two had cerebral oedema, next two had respiratory insufficiency, and one had mechanical ileus. At baseline, echocardiography showed tamponade in 6 patients (33%) and four of them had intra-abdominal hypertension pre-operatively that normalized after operation. Pearson correlation showed no significant finding in analysed criteria.
Conclusion

Previous experience of intra-abdominal pressure measurement in cardiac surgical adult patients indicate 30 percents occurrence of intra-abdominal hypertension. The research results presented similarly in group of our patients undergoing scheduled surgery with cardiopulmonary bypass. High intra-abdominal pressure is an independent risk factor for patients in critical state. As demonstrated by the results, measuring of intra-abdominal pressure is so rarely performed and seems to be underrated method in cardiac surgery. Further research is advised.
An Experience of Local Clinical Practice Database in Managing Multidisciplinary Surgical Trauma Patients

BACKGROUND
In our northern Italy institution we handle approximately 700-750 adult & 100-150 paediatric trauma cases per year, leading to a 1,2 intrahospital multidisciplinary response team activations per day.
Routine centralization of trauma cases is based on prehospital haemodynamic parameters and mechanism of injury, resulting in 50-60% of overtriage. As per protocol every trauma patient is evaluated by the intrahospital trauma team in the trauma bay while the emergency surgery OR, or the first available, is put on hold.

Overtriage mainly takes place in prehospital rescue time due to our dispatch algorithm system that centralizes in the third level trauma center patients with a low risk of death accordingly to deranged vital parameters and/or dynamic of event. The overtriage is meant to reduce the number of patients that die, or have a harm, due to a delay in treatment. Therefore, the elimination of prehospital overtriage is neither achievable nor desirable.
We have proposed an integration between the routine introduction of Early Coagulation Support algorithm -currently and regularly used in Italian Trauma Network- and the routine calculation of TASH score, a massive transfusion predicting tool. This can be useful for several purposes:
- promptly obtaining massive transfusion multiple haemoderivatives pack from internal transfusional service;
- limiting the time the emergency operating room and personnel are put on hold;
- registering and stratifying every trauma case and therefore empower local workflow.

Registry data are a valuable resource for trauma epidemiological and comparative effectiveness research studies, and the implementation of locally adapted treatment algorithms can result in achieving measureable improvements in patient outcome.

The aim of the study is to assess if TASH is sufficiently powerful to predict the correctness of intrahospital patient path (i.e. stop/non stop of emergency OR equipe; use/non use of hybrid OR).
MATERIALS AND METHODS

We planned to institute a prospectively collected registry of all trauma patients admitted in our institution. We will collect: demographic data (age, gender); reason for referral to a tertiary center (vital parameter, event dynamic, logistic); prehospital/admission/ED discharge vital parameters; TASH score; administered fluids and blood derivatives (both in ED and OR); length of ED stay; time to definitive treatment; fluid therapy; hospital mortality.

This data will be collected directly or connecting generated dataset with local surgical registry. The parameters collected in the ER will be derive from the electronic chart the ED physician fills in. The electronic chart is a compulsory evaluation form that collects the minimal requirements for evaluation of a trauma patient. Main outcome will be immediate treatment (IT) defined as direct access to OR and/or hybrid OR and/or angiography. We will compare the IT group vs the delayed one.

Descriptive statistics will be presented as mean with standard deviation (SD) and median with interquartile range (IQR). Comparison between categorical variable will be performed by chi-square test or Fisher's exact test as appropriate. For continuous variables we will use Mann–Whitney test or Kruskal–Wallis test, when more than two groups will be compared. Statistical significance threshold will be set at $p<0.05$. Prognostic factor analysis will be done by a logistic regression analysis. We'll perform an univariate analysis between all the variables and the IT outcome. The statistically significant ones will be used to run a logistic regression for IT. A backward stepwise procedure will be performed to exclude the not significant variables. Calibration ability will be assessed by a ROC analysis, discrimination by Hosmer Lemeshow goodness-of-fit statistic.

Furthermore, the registry will contain treatment and prognostication of trauma patients admitted to ER.

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Open abdomen in Monza: one year experience

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Introduction: Open abdomen (OA) is a controversial technique in emergency surgery; despite is not new indications and management are still debated and discussed. The aim of the preset abstract is to present the Monza’s experience during a year in patients with open abdomen.

Methods: all the patients treated with open abdomen were retrospectively retrieved and reviewed. For each patients demographics, indication, techniques adopted and outcomes were recorded.

Results: during the year 2016 27 patients were treated with open abdomen: mean age was 66.89(±13) and 55% were male; mean BMI was 28.12(±5.23). OA was indicated for Vascular emergencies and hemorrhage in 6 (22%) patients, bowel ischemia in 2 (7%), pancreatitis in 1 (4%) patient, post-operative abdominal compartment syndrome in 2 (7%), acute peritonitis in 6 (22%) patients, post-operative peritonitis in 7 (26%) patients and trauma in 3 (11%) patients. In 25 (92%) patients was adopted a commercial negative wound pressure therapy technique; in one was adopted Barker vacuum pack and in one a commercial NPWT technique adding a dynamic tension (the Acosta technique). The mean duration of the treatment was 9.81(±11.03) days with 4.3(±3.6) as a mean number of medication’s change. Mortality during the treatment was 29.6% and definitive closure was achieved in 70.4%. In four patients primary fascia closure was not achieved and a biological prosthesis was implanted. 6 patients died after the definitive closure. Overall mortality was 52%. EAF developed in 11% of patients. Mean number of ventilation days was 7.89(±8.96) and mean ICU length of stay was 20.11(±20).

Conclusion: Open abdomen has several indications in critically ill patients. Mortality and morbidity are elevated. No clear indication exists and more studies are needed to conform the indications.