

**Analyses of the of the self-reported confidence level of ASSET course among participants and instructors**

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**Introduction:** ASSET (Advanced Surgical Skills for Exposure in Trauma) course is one of the Trauma Education courses developed by the American College of Surgeons, and it has been spread all over the world mainly in the United States since 2010. We conducted the ASSET courses in Japan in 2017. In this study, we analyzed the self-reported confidence level of each trauma surgical procedure using ASSET course questionnaire survey collected from participants and instructors.

**Methods:** A total of 16 participants were enrolled and completed the course evaluation. Participants were evaluated the self-reported confidence level using a 5-point Likert scale. 4 instructors evaluated the level of the participant they have that the participant can perform each procedure. We compared the score of the self-reported confidence level between student and instructor.

**Results:** The 44 items were evaluated by both participants and instructors regarding the cervical /chest / abdomen / upper limb / lower limb surgical procedure. The self-reported confidence level of the instructors (33/44/65/20/36) (median) were higher in the cervical, chest, and abdomen than that of the students (28/39/52/19/34).

**Conclusion:** The discrepancy of the evaluation might be influenced by several factors such as psychological element or experience. Further analyses of these factors would be an important in the future.

**Comparison with aortic cross clamping and resuscitative endovascular balloon occlusion of the aorta for sever torso trauma.**

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**Introduction:** The use of resuscitative endovascular balloon occlusion of the aorta (REBOA) has increased in recent years. Our facility has employed aortic cross-clamping (AXC) for aortic occlusion (AO) during trauma resuscitation since 2000. However, the use of REBOA remains controversial. This study aims to compare AXC with REBOA in terms of survival discharge for patients with severe torso trauma.

**Methods:** This retrospective study was conducted at a single trauma center in Japan between 2012 and 2015, and included patients with AO. Seventy-five eligible patients with AO (excluding those with cardiac arrest on arrival) were divided into the following two groups based on the initial treatment decision: AXC (N=58) and REBOA (N=17). The association between the initial treatment decision and patient survival was examined using multivariable logistic regression analysis.

**Results:** This study included 75 patients (94.7%) who sustained blunt injuries with a median age of 61 [43–74] years. Prehospital treatment, including AXC, was performed to 78.7% of the patients. The initial treatment of 50 patients (86%) in the AXC group was converted from ACX to REBOA. There was no difference in age and Injury Severity Score (ISS) between the two groups. The AXC group had significantly lower chest injury proportion (Maximum Abbreviated Injury Scale  $\geq 3$ ), Revised Trauma Score (RTS), and prothrombin time (PT) activity (PT%) than the REBOA group (AXC vs. REBOA: chest injury, 94.8% vs. 64.8%,  $P=0.001$ ; RTS, 3.07 [2.19–5.14] vs. 5.14 [4.82–6.71],  $P<0.001$ ; PT%, 43.7 [34.4–61.1] vs. 68.9 [55.6–77.0],  $P=0.001$ ). Additionally, the AXC group had higher lactate values than the REBOA group (8.8 [5.9–11.7] vs. 4.2 [3.1–7.6],  $P<0.001$ ). Patients in the AXC group had a lower probability survival rate, which was calculated using the Trauma and Injury Severity Score method, and a lower actual survival rate than those in the REBOA group (9.7% vs. 31.3%,  $P=0.02$ ; 24.1% vs. 52.9%,  $P=0.02$ , respectively). Multivariate analysis, which was adjusted for risk of age, ISS, and RTS, did not show a clear benefit of REBOA as a primary treatment choice on the survival discharge of patients with AO (odds ratio, 2.01; 95% confidence interval, 0.46–9.78;  $P=0.384$ ). REBOA procedure-related complications was observed in 10.4% of the patients (7/67; vascular injury, 2; limb ischemia, 7).

**Conclusion:** AXC is a reasonable treatment choice for severe trauma patients with impending cardiac arrest. Although REBOA was selected for patients with high RTS, no remarkable difference in the survival discharge was observed between the REBOA and AXC groups. So far, REBOA cannot yet replace AXC as a treatment device for patients with severe trauma.

## **POINT-OF-CARE ASSAY FOR THROMBIN GENERATION IN TRAUMA PATIENT AND HEALTHY DONOR FRESH BLOOD**

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**Introduction:** Hemostatic potential in trauma patients may be assayed by measurement of viscoelastic clot strength, fibrinolysis, and quantitation of specific coagulation factors. One of these factors, thrombin, has demonstrated clinical relevance in predicting hypercoagulable events, and thrombin generation (TG) is accelerated in the presence of histones and Factor (F)XIa. There are no standard assays for measurement of thrombin generation in whole blood at the point-of-care. In this study, a new point-of-care device for measurement of TG in fresh whole blood was utilized to evaluate the contribution of histones and FXIa to procoagulant activity in trauma patients and healthy donors. Simultaneous measurement of clot formation with rotational thromboelastometry (ROTEM) methodology under identical conditions was used to confirm the nature of procoagulant activity in the trauma population.

**Methods:** Blood from healthy volunteers and trauma patients (both male and female) was collected into 3.2% sodium citrate. Anti-histone antibody (0.3 mg/mL) was added immediately ("0 minutes") or 15 minutes after blood draw, along with addition of corn trypsin inhibitor (CTI; 0.1 mg/mL) at 0 or 15 minutes to block contact pathway activation. Clot formation and TG were analyzed using ROTEM and point-of-care TG methodologies, respectively, in the presence and absence of an anti-FXIa antibody (0.1 mg/mL). Concentrations of FXIa were calculated using calibration curves generated from titrating purified FXIa into healthy donor blood.

**Results:** Whole blood samples from 6 trauma patients and 5 healthy volunteers were analyzed. Average ROTEM clotting times for the trauma patients were 8 +/- 2 minutes shorter than that of the healthy donors. Average point-of-care TG lag phases in the trauma patients were 4 +/- 1.5 minutes shorter for the same condition. Lag phases were reduced more than 4-fold if left to incubate for 15 minutes before addition of CTI, for both populations. All conditions exhibited prolonged lag phases and clot times in the presence of anti-FXIa antibody. Moreover, FXIa concentration was reduced 2 to 3-fold following addition of anti-histone antibody at 0 minutes compared to 15 minutes.

**Conclusions:** Trauma patients demonstrated increased procoagulant activity compared to healthy donors, in both assays. The observed increases in activity are partially related to generation of FXIa over time in citrated blood. Furthermore, histones appear to amplify FXIa generation.

**The size of pelvic hematoma can be predictive factors for angioembolization in hemodynamically unstable pelvic trauma**

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**Introduction:** Unstable pelvic fracture with bleeding can be fatal, with a mortality rate of up to 40%. Therefore, early detection and treatment are important in unstable pelvic trauma. We investigated the early predictive factors for possible embolization in patients with hemodynamically unstable pelvic trauma.

**Methods:** From January 2011 to December 2013, 46 patients with shock arrived at a single-hospital within 24 hours after injury. Of them, 44 patients underwent computed tomography(CT) after initial resuscitation, except for 2 who were dead on arrival. Nine patients with other organ injuries were excluded. Seventeen patients underwent embolization. Demographic, clinical, and radiological data were reviewed retrospectively.

**Results:** Among 35 patients with hemodynamically unstable pelvic fracture, 22 (62.9%) were men. Width ( $p=0.002$ ) and length ( $p=0.006$ ) of hematoma on CT scans were significantly different between the embolization and non-embolization groups. The predictors of embolization were width of pelvic hematoma (odds ratio[OR]:1.07,  $p=0.028$ ) and female sex (OR:10.83,  $p=0.031$ ). The cut-off value was 3.35cm. More embolization was performed (OR:12.00,  $p=0.003$ ) and higher mortality was observed in patients with hematoma width  $\geq 3.35$ cm (OR:4.96,  $p=0.048$ ).

**Conclusion:** Patients with hemodynamically unstable pelvic trauma have a high mortality rate. CT is useful for the initial identification of the need for embolization among these patients. The width of pelvic hematoma can predict possible embolization in patients with unstable pelvic trauma.

## **Preparing Japanese surgeons for potential mass casualty situations will require systematic programs.**

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**Introduction:** The ongoing state of global geo-political instability means that it is prudent to prepare civilian surgeons to manage major military-type trauma. Many countries including Japan has experienced a prolonged period of peace and consequently it is unlikely that surgeons will have been exposed to a sufficient volume of trauma cases. This study reviews the state of trauma training and preparedness in Japan and reviews the trauma workload of a major Japanese emergency medical center and compared with a major South African trauma center with the intention of quantifying and comparing the time needed to gain adequate exposure to major trauma at the two centers.

**Methods:** The literature describing the surgical burden from a number of recent military missions was reviewed and the core surgical skills to manage military-type injuries were identified. We then went on to review all patients admitted to both Kurashiki Central Hospital (KCH) and Pietermaritzburg Metropolitan Trauma Service (PMTS) following trauma between the period September 2015 and August 2016. The burden of trauma at each center was quantified and the number of core surgical competencies or procedures performed at each center was then reviewed. These were then compared with the number of the core procedures which were performed on the reported military missions.

**Results:** Three reports on military surgical missions were reviewed. These came from the Dutch, French and British military surgical services. The most common procedures were wound debridement and orthopedic fixation, followed by trauma laparotomy, neck exploration and thoracotomy. During the 12 month study period, 309 trauma patients were admitted to KCH. There were 10 penetrating injuries and 299 blunt injuries. Of the penetrating injuries, there were no gunshot wounds. The mechanisms of injury for blunt trauma were as follows: Road traffic accidents (RTAs); 141 (47%), fall; 136 (46%) and other injuries; 22 (7%). In the same period, 2887 trauma patients were admitted by the PMTS. There were 1244 cases (43%) of penetrating trauma and 1644 cases (57%) of blunt trauma in PMTS. The mechanisms of injury for penetrating trauma were as follows: Stab wounds (SWs); 955 (77%), gunshot wounds (GSWs); 252 (20%) and other injuries; 37 (3%) and for blunt trauma were as follows: Assault; 739 (45%), RTAs; 669 (41%), fall; 166 (10%) and other injuries; 70 (4%). The exposure to all the key competencies required to manage trauma is overwhelmingly greater in South Africa than Japan. The length of time needed to obtain an equivalent trauma exposure to that achieved in South Africa, working in Japan is prohibitively long.

**Conclusion:** Trauma training in Japan is hamstrung by a lack of clinical material as well as by systematic factors. Training a trauma surgeon is difficult. Developing a trauma system in the country may help address some of these deficits. South Africa in contrast has a huge burden of trauma and sufficient infrastructure to ensure that surgeons working there have adequate exposure to major trauma. Developing an academic exchange program between Japan and South Africa may allow for the transfer of trauma experience and skills between the two countries.

**Analysis of the Use of Anti-thrombin III in the Severe Trauma Patients..**

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**Introduction:** Antithrombin is a potent inhibitor of thrombin and have a properties of anticoagulant with anti-inflammatory property. In trauma patients, anti-thrombin level is inversely related with the injury severity score(ISS) and low anti-thrombin III level is related with multi-organ failure(MOF). We hypothesized that antithrombin could attenuate the detrimental effects on the inflammatory process and organ function. We evaluated the influence of anti-thrombin III on the MOF and mortality in the severe trauma patients (ISS>15)

**Methods:** This is a retrospective study using Trauma Database of our hospital between January, 2016 and December, 2016. Major trauma patients (ISS>15) with low anti-thrombin level(<70%) were enrolled in this study. We divide the patients into antithrombin using group(AT-III(+)) vs non-using group(AT-III(-)) and compare the mortality, MOF, bleeding event between two groups.

**Results:** Total 99 patients were included in this study and mean ISS score of the patients was 25.1. Antithrombin level of survivor group(59.3%) was higher than non-survivor group(44.7%)( $p=0.002$ ). All cause mortality of AT-III(+) (22%) was lower than AT-III(-) (33%)( $p=0.791$ ). MOF of AT-III(+) was 8% and lower than that of AT-III(-)(26%)( $p=0.047$ )

**Conclusion:** Antithrombin level is inversely correlated with severity of trauma. There was no difference of mortality between antithrombin using group and non-using group. Antithrombin appear to attenuate the post traumatic response and multi organ failure.

## TRAUMATIC DIAPHRAGMATIC HERNIA: HOW TO IMPROVE THE DIAGNOSIS?

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**Objective:** Traumatic diaphragmatic hernia (TDH) is uncommon and difficult to diagnose in trauma patients. The aim of this study is present demographics, how to improve the diagnosis, surgical treatment and outcomes.

**Method:** This is a retrospective trauma registry based study in a single university trauma center between 1990-2017.

**Results:** A total of 3.003 trauma patients were submitted to exploratory laparotomy. 425 (14.1%) had a diaphragm injury AAST grade <sup>3</sup> II. TDH was identified in 55 cases (12.9%), with predominance of male (46 cases - 83.6%), and age ranging from 13 to 59 years old (median 34). Blunt TDH occurred in 40 cases (72.7%; automobile accident in 26 cases) and penetrating TDH in 15 cases (27.3%; stab wound in 9 cases). Diagnosis was made mostly by chest x-ray (CXR) in the trauma bay (31 cases - 56.3%), following the intraoperative finding (13 cases - 23%). Laparotomy was performed in 54 cases (98.1%) and only one patient with stab wound was treated by laparoscopy. In two patients with chronic TDH was necessary associated thoracotomy. In 13 patients (23.6%) with hemodinamically instability the diagnosis was intraoperatively, 2 cases with diagnostic peritoneal lavage. The surgical indication was based in CRX in the trauma bay in 30 cases (54,4%). computed tomography in 7 cases (12.7%), laparoscopy in 3 cases (5,4%), in 3 cases 2 converted to laparotomy. 49 cases with left side, 5 right side and 01 bilateral. The stomach was the organ most frequently found herniating into the chest (38 cases). The rate of pulmonary complications was 18 cases (66%). The LOS average was 14 days. The mean ISS was 24. Overall mortality was 20% (11 of 55).

**Conclusion:** TDH was identified in few trauma patients (1.8%) admitted at our hospital, mainly after blunt trauma. Despite advances in imaging methods, CXR is still useful in the diagnosis or suspicion of TDH and the ATLS® protocol should be followed. CT is helpful for the diagnosis of TDH and identifies associated injuries. Laparoscopy was useful diagnosis in three patients but only one was treated laparoscopilly. Laparotomy remains the gold standard for the diagnosis and treatment.

**OUTCOMES OF EMERGENCY DEPARTMENT LAPAROTOMY IN  
NON-RESPONDER AFTER RESUSCITATION; EARLY EXPERIENCE IN A  
SINGLE CENTER**

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**Introduction:** Outcomes of patients with bleeding depend on how rapid bleeding stop. Emergency department laparotomy is considered one of ways to reduce intra-abdominal bleeding. Here we evaluated the outcomes of emergency department laparotomy through the early experience of a single trauma center.

**Methods:** We reviewed medical records and data of patients who were non-responder after resuscitation and underwent emergency department laparotomy between January 2016 and December 2017.

**Results:** Twelve patients underwent emergency department laparotomy. Ten patients had sustained blunt trauma, and two were victims of abdominal stab wounds. Injuries to the small bowel, spleen, and liver were most common. One patient could not reach the operating room. Three of 12 were survived. One of three who were survived had severe neurologic sequelae.

**Conclusion:** Patients that underwent emergency department laparotomy showed high mortality. However, emergency department laparotomy can be considered as an option to reduce intra-abdominal bleeding for non-responder after resuscitation.

**Predictive value of computed tomography in diagnosing bowel and/or mesenteric injuries after blunt trauma: Correlation with surgery findings.**

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**Introduction:** Bowel and mesenteric injuries occur in about 5% of blunt abdominal trauma patients. Delay in diagnosis may increase the morbidity and mortality. Computed tomography(CT) is the current accepted standard imaging modality for abdominal organ injury diagnosis and is now considered accurate in the diagnosis of bowel and mesenteric injuries. There is still controversy as to how reliably CT alone could help identify those blunt bowel and mesenteric injuries requiring surgery. Aims of this study are to review the correlation between CT signs and intraoperative finding in case of bowel and mesenteric injuries following blunt abdominal trauma and identify the diagnostic specificity of those signs found at CT with practical considerations on the following clinical management.

**Methods:** This is single-center retrospective study of trauma patients from March 2010 to December 2017. All patients admitted to our hospital after blunt trauma and CT scan at admission were assessed. 211 patients required operative management following blunt trauma. Data were analysed correlating operative surgical reports with the preoperative CT findings.

**Results:** 77 patients presented bowel and/or mesenteric injuries. The median patient age was 50 years(12-75 years), 75% of the patients were male(n=58). 78% of the patients were CT grade 5. 3% of patients(n=2) showed CT grade 1. The median length of stay and ICU were 26 days(1-254) and 4 days(0-91)

**Conclusion:** All images, charts and tables must be placed and uploaded in the body of your abstract exactly as you want them (please remove this line when creating your abstract).CT scan is the gold standard in the assessment of intra-abdominal blunt abdominal trauma for not only parenchymal organs injuries but also detecting bowel and/or mesentery; in the presence of specific signs it may provides an accurate assessment of hollow viscus injuries, helping the trauma surgeons to choose the correct initial clinical management.

## CLINICAL SIGNIFICANCE OF CULTURE OF PAD USED FOR PACKING IN DAMAGE CONTROL LAPAROTOMY

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**Introduction:** Damage control laparotomy (DCL) is a technique utilized to care of massively injured trauma patient. We conducted bacterial analysis of the pad used for packing in DCL and studied its association with morbidity and mortality.

**Methods:** This is a retrospective review of all patients undergoing immediate laparotomy at our institute between 2011 and 2015. DCL was defined as temporary abdominal closure at the initial surgery. 18 consecutive patients undergoing DCL were analyzed. Microbiologic samples from pad used in DCL were collected.

**Results:** 15 microorganisms were cultured. Samples from 12 (66.7%) patients were positive by microbiologic culture and six (33.3%) patients were negative. Morbidity rate (91.7% vs. 66.7%) and mortality rate (41.7% vs. 16.7%) were higher in patients with positive culture than patients with negative culture. Infection rates such as surgical site infection (75.0% vs. 33.3%) and sepsis (41.7% vs. 16.7%) were higher in culture-positive patients. Four patients underwent two or three take back surgeries and all samples from these patients were positive for microorganism.

**Conclusion:** There was a high infectious complication rate in patients with positive culture of pad. And two or more frequent take back surgery seems to increase risk of infection in DCL.

## A RARE CARDIAC TRAUMA BY MACHETE

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**Introduction:** Chest trauma is one of the most common causes of death corresponding to 20 to 25 % of cases. It can be blunt or penetrating trauma. The majority of the patients, 85%, can be managed only with a tube thoracostomy and only 10 to 15 % will require a trauma *thoracotomy*. Conventional indications for emergency thoracotomy are divided into acute and not acute. One of the most common indications of thoracotomy in trauma is the amount of blood immediately exiting the thoracic drain: immediate drainage of 1,500 ml of blood and deterioration of the hemodynamic status.

**Methods:** This was an observational study characterized by clinical inspection of a patient with chest trauma by machete.

**Results:** A 37-year-old man entered on our emergency room at a central hospital of Rio Branco – ACRE, Brazil, with a blunt, linear, 20-cm (Figure 1) sucking chest wound on the right side, caused by a machete. Respiratory rate was 25 per minute, saturating 90% on ambient air, blood pressure (BP) of 110x70 mmHg and heart rate of 115 per minute, he was semiconscious. After the initial care, the patient becomes better and a great question came to mind: operate or treat conservatively?

**Conclusion:** Noting that the machete is a very contaminated object, used in various situations in agriculture, and that we are facing a large and deep lesion with a large part in the Ziedler area and that the machete as shown must have a great impact energy. We decided to go to the surgical center thinking that a large thoracic wound could not be well cleaned without general anesthesia. In the operating room, the lesion was enlarged to the lateral side and a Finochietto retractor was used. A large transversal laceration was observed on the pericardial sac, associated with phrenic nerve lesion and right diaphragm paralysis (Figure 2). At that moment the right anterolateral thoracotomy was complemented with a transverse sternotomy with the control of the proximal and distal right mammary artery. There was a right atrial lesion of about 3 cm with a large clot. The lesion was controlled with a Satinski tweezers and a running suture with 4-0 prolene. There was also an injury to the right ventricle with associated lesion of a distal branch of the right coronary artery, controlled with U stitches. (Figure 3)



**DELAYED RUPTURE OF SPLENIC PSEUDOANEURYSM AFTER BLUNT ABDOMINAL TRAUMA**

Younggoun Jo MD, Yunchul Park MD, Jungchul Kim MD, Chonnam National University Hospital

**Introduction:** Incidence of splenic pseudoaneurysm after abdominal trauma could result in critical consequences. Here, we present a case of delayed rupture of splenic pseudoaneurysm after blunt abdominal trauma

**Methods:** A 68 year-old man referred to our hospital with an abdominal pain and hemodynamic instability. 3 months ago, he bumped into cultivator handle while he was moving the vehicle. At that time, he didn't undergo any examination about accident. On laboratory findings, hemoglobin was 9.1 g/dL and lactate was 2.0 mmol/L. Abdominal computed tomography(CT) showed large amount of perisplenic hematoma with irregular margin of spleen and hemoperitoneum at right paracolic gutter and pelvic cavity.

**Results:** An immediate angiography was performed. Superselective angiogram showed pseudoaneurysms at splenic artery branches. Coil embolization was conducted with microcoils. 1 week later follow up CT showed no remarkable change of laceration of spleen without bleeding and patient was discharged without any problems.

**Conclusion:** After high powered blunt abdominal injury when possible proper evaluations should be performed to prevent the occurrence of late devastating events.

**Colonic stricture after angioembolization of pseudoaneurysm at left colonic artery**

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**Introduction:** Rupture of pseudoaneurysm at mesentery can result in fatal consequences. Interventional radiology is one of the treatment methods. Here, we present a case of delayed stricture of left colon after angioembolization at branch of left colonic artery.

**Methods:** A 68-year-old man referred to our hospital after a cultivator rollover accident. Abdominal computed tomography (CT) showed liver laceration and segmental thrombotic occlusion in left common iliac artery. Percutaneous angioplasty was done at left common and external iliac artery. On the third day of hospitalization, patient showed sudden signs of shock and follow-up abdomen CT showed bleeding in left mesentery with large amount of hemoperitoneum.

**Results:** An immediate angiography was performed. Selective angiogram showed pseudoaneurysms at ascending branch of left colic artery. Coil embolization was conducted with microcoils. 1 month later patient presented abdominal distension with pain and follow-up abdomen CT showed left colonic obstruction. Emergency operation was performed and subtotal colectomy was done.

**Conclusion:** Angioembolization at colonic artery can cause a rare complication, such as colon obstruction. Careful observation and follow-up after procedure is mandatory for rapid diagnosis and treatment.

**DAMAGE CONTROL SURGERY WITH PAD PACKING FOR ACTIVE BLEEDING IN CRUSHING WOUND OF THE PERINEUM AND AMPUTATED LEG STUMP**

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**Introduction:** We reported a case of crushing wound of the perineum and amputated leg stump which was treated by damage control surgery with pad packing.

**Methods:** A 67-year-old man had a crushing injury. His left leg was sucked in the wheel of a tractor. His systolic blood pressure and hemoglobin level upon admission were 50 mm Hg and 7.5 g/dL, respectively. His perineum and leg had multiple crushing open wounds and open fractures. The large defect of the leg wound was considered to require amputation above the knee, which was performed immediately with the closure of the perineal wound. However, a large volume of bloody discharge was observed in the perineal and leg stump wounds postoperatively. Massive transfusion was performed, and a second operation was performed. In the second operation, large bloody oozing of muscle and several arterial bleeders was observed. Although the bleeders were ligated, the bloody oozing continued. To control the bloody oozing, pad packing to the perineal and thigh stump wounds, and approximation with suture to compress the wound were performed. Diverting colostomy was performed to protect the wounds.

**Results:** After pad packing, the bloody discharge stopped and the pad was removed in the third operation. Owing to the large defects with infection of perineal and thigh stump wound, negative pressure wound therapy and repeated irrigation with debridement were performed. At 6 months after the first operation, his wound was completely healed, and colostomy repair was performed.

**Conclusion:** In this case, the hemodynamically unstable, crushing perineum wound and leg stumps were treated safely by damage control surgery with pad packing.

## LEFT VENTRICLE INJURY ASSOCIATED WITH CARDIAC TRAUMA BY GUNSHOT WOUND: A CASE REPORT.

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**Introduction:** The incidence of cardiac trauma is low in the universe of traumatic injuries. Right ventricle (RV) is the most affected cardiac chamber in the penetrating cardiac trauma.

**Methods:** R.L.R. 42, male, brought Trauma Center due to gunshot injury with an entry orifice in the left paravertebral dorsal region, with no exit orifice. During the initial clinical examination, the patient was eupneic in ambient air, vesicular murmur and pulmonary expandability reduced in the left hemithorax, O<sub>2</sub> saturation 98%, systemic blood pressure of 210 x 110 mmHg, heart rate of 104 beats per minute. Glasgow Coma Scale 14.

**Results:** A left anterior thoracotomy was performed, showing hemopericardium, with left ventricular (LV) transfixing wound, with left posterolateral entry orifice and extensive anterolateral exit orifice associated with bulky bleeding. The patient was referred to the Intensive Care Center with satisfactory evolution.

**Conclusion:** Penetrating wounds of the left ventricle, even less common, may present a favorable outcome if approached and treated effectively.



## DAMAGE CONTROL IN ABDOMINAL TRAUMA: A CASE REPORT

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**Introduction:** Hypothermia, coagulopathy and acidosis, a vicious cycle generally known as “the lethal triad”, contribute significantly to the increase in trauma-related mortality. Prolonged surgical time has been shown to worsen hemodynamic status, and if it is a reversible cause, such as hypovolemic shock, damage control should be the choice

**Methods:** A 24-year-old male patient was victim of multiples gunshot wounds in abdomen. At admission, he was unstable and in shock despite fluid resuscitation. At physical examination he presented an abdominal gunshot wound (left iliac fosse). Abdomen was flaccid and diffusely painful. On the laparotomy was evidenced lesion in 40% of the intestinal loop circumference at 80cm from the Treitz and lesion in 60% of the circumference of the sigmoid colon. Opted for damage control surgery through the raffia of small intestine lesion, sigmoid resection and burial of stumps, ureterostomy, anastomosis of the branches of the left iliac vein, using hemostats and pelvic tamponade. Referred to the ICU after 3 hours of surgery. A new reassembly was performed after 36 hours with removal of the compresses, catheterization of the ureter and terminal colostomy. He was discharged from the ICU after 13 days

**Conclusion:** Damage control has proven to be an important ally to the restoration of the physiological parameters of the polytraumatized patient. Due to the large number of injuries in this patient, we could not perform damage control in one hour as it is recommended. Even though it was not faithful to the ideal surgical time, the choice of controlling potentially fatal lesions was fundamental for better healing and enhance the patient’s hemodynamic status.

**TENSION PNEUMOTHORAX SECONDARY TO  
EXPANDING HEMORRHAGIC PNEUMATOCELE AFTER BLUNT CHEST  
TRAUMA**

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**Introduction:** Tension pneumothorax can lead to hemodynamic shock by impairing blood return to the heart and restricting cardiac output. Typically, this is may be due to a large pneumothorax or hemothorax. A pneumatocele is a cavity in the lung parenchyma usually filled with air that may result from pulmonary trauma. We present the first report of a hemorrhagic pneumatocele secondary to trauma resulting in a tension pneumothorax.

**Methods:** 18 year old male presented to trauma center in shock, complaining that 'he could not breathe'. He was subsequently intubated, and a right tube thoracosctomy placed for diminished breath sounds. Chest computerized tomography identified a large air-fluid cavity with extravasation of contrast, suggesting ongoing hemorragae into the pneumatocele. The chest tube continued with scant output. Patient's hemodynamic condition continued to deteriorate, and repeat chest XR demonstrated significant right to left mediastinal shift. Right thoracotomy was performed and massive hematoma removed from the pneumatocele.

**Results:** The patient's hemodynamic condition improved after the large mass occupying hemothorax was evacuated from the hemorrhagic pneumocoele contained in the right chest cavity.

**Conclusion:** Hemorrhagic pneumatocele is rare, and has never been described as a cause for tension pneumothorax. Do to the location of hematoma, a conventional thoracostomy tube can not release the tension -a thoracotomy is needed. We describe the first report of a tension hemorrhagic pneumatocele.

## **NON-OPERATIVE TREATMENT OF A TRAUMATIC GRADE V PANCREATIC LESION - CASE REPORT**

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**Introduction:** Although pancreatic trauma is not a common injury, the mortality could be as high as 50% in complex cases. The typical mechanism of injury is the compression of the epigastric area against the vertebrae. The current treatment for grade V lesions is the Whipple procedure.

**Methods:** Male patient, 18 years, transferred to our trauma center level I after 48h of a blunt abdominal trauma. The first attendance and diagnosis were made at a rural Hospital after 36h of trauma. He arrived at our facility hemodinamically stable but with a persistent abdominal pain and nausea. A new abdominal CT scan was made and showed a laceration at the pancreatic head and a large amount of free abdominal fluid.

**Results:** The surgical team decided to perform an exploratory laparotomy. During the procedure, it was diagnosed a large hematoma of head and uncinata process of pancreas, without other lesions (duodenum, bile duct and pancreatic body were intact). It was decided to only drain the abdominal cavity. It was started TPN in the immediate postoperative and the enteral feeding was re-started 10 days after the procedure with good acceptance; no other surgical procedure was done.

**Conclusion:** The patient was discharged after 28 days of hospitalization with a good evolution. He is still in follow-up without any complications.

## **ENDOVASCULAR REPAIR FOR AXILLAR ARTERY INJURY - CASE REPORT**

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The use of endovascular technique for the correction of penetrating traumatic vascular injuries is being encouraged, especially for those which the traditional approach could have a higher morbidity due to the location. Lesions at the subclavian and axillar arteries are one of these cases

The case we present is male patient, 28y, that arrived at our hospital with a gunshot wound at the right shoulder without exit. At the first attendance, he was instable due to a pneumo/hemothorax which was promptly drained. After the clinical stabilization, he still didn't have right braquial/ radial pulse, but the arm had good perfusion (no pain, good warming and capillary filling). An angiography by CT scan was performed and showed partial lesion of axillar artery but with good distal perfusion. As the patient remained stable, he was transferred for another hospital and the endovascular repair was done with a good result.

**A case series study of blunt trauma causing aortic injury.**

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**Introduction:** Aortic injury caused by blunt trauma is common but it presents various types of injury. Most cases are found dead or to have already fallen into a cardiopulmonary arrest when the patient arrives at a hospital. Some cases demonstrate progressive or delayed onset of aortic injuries, especially aortic dissections, which are sometimes difficult to treat. This study is to investigate what types of aortic injuries caused by blunt trauma are seen in one of the largest trauma centers in Japan.

**Methods:** Retrospective review of the patient records of blunt trauma cases with aortic injury for 10 years since 2007 in one of high volume trauma centers in Japan was performed. Each case alive on arrival was discussed in detail.

**Results:** Out of approximately eighty thousand ambulance cases and thirty thousand admissions for 10 years in total, only 19 cases showed an aortic injury caused by blunt trauma. A total of 11 cases presented a cardiopulmonary arrest on arrival, and 8 cases of them seemed to have died mainly of severe aortic injury and the rest died of other organ injuries. Eight cases were alive on arrival and 2 of them were initially asymptomatic. Types of aortic injury were Stanford type A aortic dissections in 3 cases, type B in 3 cases, and aortic rupture in 2 cases. Two cases of type A dissection underwent an emergency operation, whereas all 3 type B dissections went on a good course with conservative treatment.

**Conclusion:** Aortic injury caused by blunt trauma is rare in Japan. Stanford type B aortic dissections did not require aortic repair and showed good prognoses.