Spring Issue

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THE LEVEL 1 TRAUMA CENTER

TRAUMA 1 ALERT

Case Study:

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by Jeffrey Rosen, MD, FACS

A 30-year-old male was involved in a head on motor vehicle crash. Upon arrival by paramedics a quick survey revealed the following pertinent information: Responsiveness to painful stimuli with dilated, but reactive pupils. His airway was patent and he had no stridor. He had decreased breath sounds on the right side for which a needle decompression was performed. Heart rate was noted to be a sinus tachycardia at 140. An IV was started and he was given a fluid bolus. His respiratory rate was 36 and he was assisted with a bag valve mask. His total field and transport time to a Level II Trauma Center was 10 minutes.
Upon arrival at the Level II Emergency Room his vital signs were a HR of 130 with a BP systolic of 120. His exam was significant for a GCS of 7 as well as decreased breath sounds on the right, despite an apparent patent angiocatheter in the 2nd intercostal space. Due to his GCS he underwent Rapid Sequence Intubation with paralytics and sedation. After the intubation, a chest tube was placed in the 6th intercostal space on the right side. The rest of his physical exam was unremarkable except for a scalp abrasion/laceration. He was given a fluid bolus and then underwent CT scanning which revealed a negative brain scan but a positive right residual small pneumothorax as well as a Grade IV liver laceration with significant hemoperitoneum (Figure 1).

At this time, his systolic pressure dropped into the 80’s. The patient was given 2 units of blood for presumed hypotension due to acute blood loss. Due to his significant liver injury the referring hospital felt he should be cared for at a Level I Trauma Center. The patient was transported to Good Samaritan Hospital Level One Trauma Unit
Upon arrival to our Emergency Department the patient was examined and found to have the following injuries, as identified by the Level II Center:

1. Closed head injury with a concussion
2. Right pneumothorax
3. Grade IV Liver laceration with hemoperitoneum
4. Acute anemia

His vital signs had improved after the blood was given at the Level II center and two more units were given at Good Samaritan Hospital due to transient hypotension. Due to his somewhat stabilizing course he was admitted to the intensive care unit. Over the following 12 hours he dropped his systolic pressure to the 70’s and required two more units of PRBC’s to be transfused with a resultant stabilization in his blood pressure. He dropped his hemoglobin to 6.6 over the ensuing 48 hours but did not require any more transfusions. His hemodynamic picture stabilized and his hemoglobin leveled off at 9.0. He was observed in the hospital and the chest tube and endotracheal tube were removed. He was discharged on post injury day 10 with a hemoglobin of 13.3. He was ambulating and tolerating a diet and his hemoglobin was stable.

Ten days later the patient was seen in our emergency department for severe epigastric pain, nausea and right shoulder pain. He denied hematuria, dysuria, melena nor hematochezia. His pulse was 92 and his blood pressure was 88/70. The hemoglobin was 13.8. A repeat CT scan was performed and did not demonstrate any new bleeding from the initially injured segment of the liver. However, the CT demonstrated a pseudoaneurysm of a branch off the right hepatic artery without extravasation of contrast (Fig. 2).

His hemoglobin then dropped to 8.8 over the next 36 hours. An angiogram was performed that redemonstrated the pseudoaneurysm of a branch off the right hepatic artery. The radiology team then performed a successful selective embolization (Figs 3 and 4).

The patient did well and had no more pain and his hemoglobin stabilized. He subsequently was discharged and was recently seen in our clinic and he has no sequelae.

The liver is the most commonly injured abdominal organ after blunt or penetrating abdominal trauma. The standard treatment for a liver laceration was operative until ten years ago in the adult population. The pediatric literature supports non-operative management for at least twenty years. These changes have resulted from five ma in forces:

1. Better and faster imaging techniques, CT scanners
2. Understanding the natural history of the liver injury
3. Alternative forms of treatment than operative intervention, ERCP and Angiography
4. Past knowledge that most hepatic injuries seen at laparotomy do not require intervention as they have stopped bleeding.
5. Literature that supports the non-operative treatment of these injuries with the right support.

The caveat is that the more complex injuries need coordination of the trauma team, operative and radiological services. This may require a transfer to a higher level of care, a Level I Trauma Center, for the coordination and availability of services for emergency operative or interventional procedures. The down side to nonoperative management is the added cost to the hospitalization and monitoring. There has been a dramatic decrease in the trauma related mortality rates across the nation since nonoperative management has been instituted. Our earliest assessment of blunt abdominal trauma was Diagnostic Peritoneal Lavage or operative intervention. These approaches still have important uses in the unstable patient. However the ultrasound is the new armament of the Trauma Surgeon in evaluating an unstable patient. The ultrasound can provide the information of whether there is free fluid in the abdomen. If this is negative for fluid then there might be other sources for the hemodynamic instability. The pericardium and pleural cavities can also be visualized. In the hemodynamically stable patient, whether upon arrival or after resuscitation, the patient would probably go the CT scanner to evaluate any intra-abdominal injuries.

WELCOME!!

The Level 1 Trauma Service at Good Samaritan Hospital would like to welcome Dr. Christopher J. Cascino to our staff as a specialist in neurological surgery.

Dr. Cascino is a graduate of the University of Pennsylvania, and the Loyola University Stritch School of Medicine. He completed an internship and residency in neurological surgery at Rush-Presbyterian-St. Luke's Medical Center, Chicago, where he earned recognition for an outstanding research project by a department of surgery resident. Dr. Cascino has co-authored a number of articles and given numerous presentations related to neurological surgery.

Dr. Cascino is board certified by the American Board of Neurological Surgery. He is also a member of the American Medical Association, the American Association of Neurologic Surgeons, the Illinois State Medical Society, the Chicago Medical Society, and is an Associate Fellow in the American College of Surgeons.

Dr. Cascino currently practices with the CNS Neurological Surgery group in Palos Heights, IL.

Good Samaritan Hospital is pleased to welcome Dr. Cascino as a valuable member of our Level 1 Trauma Team!

Associated injuries can occur in up to 15% of the blunt trauma patients. The most common organs involved are the spleen and kidney. Nonoperative management for solid organ injuries raises a concern over a missed injury. The other injury that goes undetected may lead to potential morbidity or mortality that the patient may suffer.

Diagnosis of the liver injury can be difficult by physical exam, as in experienced hands the accuracy is only 50%. If one uses suspicion and clinical findings only for abdominal exploration, there are up to 66% nontherapeutic abdominal explorations. The CT scan or ultrasound is the best diagnostic modalities currently available.
The overall success rate of nonoperative treatment of liver lacerations approaches 80%. With the trend towards nonoperative treatment there have been some complications that were not seen as commonly as with operative treatments. Several of the patients now survive due to the attention being directed at resuscitation and support. These complex injuries are the ones that have produced new diagnostic and therapeutic dilemmas.
Intrahepatic Vascular fistulas, bilhemia and hemobilia. Abnormal connections between the biliary tree and the intrahepatic vascular system can occur. Hemobilia occurs when a connection between the hepatic arterial system connects to the low-pressure biliary tree. This can occur in up to 3% of the blunt liver injuries. Lower gastrointestinal hemorrhage usually occurs. The opposite can occur with an abnormal connection between the hepatic veins and the biliary tree occurs, and the bile is then pushed into the venous system. Angiography and embolization usually controls the hemobilia and an ERCP with sphincterotomy can help resolve the bilhemia.
Delayed hemorrhage can occur in up to 3% of the blunt liver trauma. The initial CT may give a clue to this high-risk patient if there is demonstration of contrast extravasation from the liver injury. Treatment is usually angiography with selective embolization.
In our case above the patient demonstrated a blush or contrast enhancement of the pseudoaneurysm in the right lobe of the liver. When he rebled an angiogram was performed and a selective embolization allowed for the patient to be cared for without operative intervention.

References:

1. Selected Readings in General Surgery Volume 26, No 2, 1999.
2. Current Problems in Surgery Volume 38 Number 1 January, 2001
3. Current Surgical Therapy Sixth Edition 1998

IMPROVED AND SIMPLIFIED CHEST TUBE INSERTION TECHNIQUE

by Gabe Alperovich, MD, FACS and Chris Salvino, MD, MS, MT, FACS

The Level I Trauma Team at Good Samaritan Hospital recently concluded a clinical research study on an improved and simplified chest tube insertion technique. The results of this research were recently presented at the American College of Emergency Physicians Conference by Dr. Gabe Alperovich.

In this study, we have demonstrated an improved technique for placing chest tubes. This is a semi-closed technique using a disposable laparoscopic trocar (device for entering a body cavity). We feel that it is easier, faster, cheaper, less painful and inherently safer than the standard open incision and dissection technique. Please read the accompanying presentation that was shown at Conference noted above.

We feel that this technique can be adopted by any emergency room physician (or other physician who puts in chest tubes urgently) with some simple training. In addition, the Trauma Team at Good Samaritan Hospital is about to enter phase II of this study. This allows us to offer two options for hospitals, particularly emergency departments, that would like to adopt this technique.

OPTION 1 Trauma Surgeons from Good Samaritan Hospital can come to your facility to give an in-service (didactic and training model) on this technique.

OPTION 2 Trauma Surgeons from Good Samaritan Hospital can come to your facility to give an in-service (didactic and training model) on this technique. In addition, we would offer to include the facility in our phase II multi-center trial; including all the prepared paperwork for IRB submission.

If you would like more details, please contact Dr. Chris Salvino at 630-275-5162.

UPCOMING EVENTS FOR 2001

As part of out ongoing commitment to continuing education, we have offerings applicable to all health care providers caring for trauma patients.

Contact our Outreach Office at 630.275.3548.

Trauma Grand Rounds

- Open to all health care providers interested in Trauma/ Critical Care.
- Free event, which includes dinner, case presentations, and a formal lecture by a nationally recognized speaker.
- CME (2.0) and CE (2.4) accredited.
- Audience participation encouraged in case presentations.

April 25, 2001
"Pediatric Ocular Trauma"
Balaji Gupta, MD

Advanced Trauma Life Support (ATLS®)

- Open to physicians only, but auditing is permitted for nurses, paramedic and medical students.
- Provides physicians with a safe, reliable method for immediate management of the injured patient.

October 12-13, 2001

Emergency Nursing Pediatric Course (ENPC)

- Open to RN's with 6 months clinical experience in the Emergency Department setting.

August 20 & 27, 2001

Course in Advanced Trauma Nursing (CATN)

- Open to Registered Nurses (ED & Critical Care).
- Thirteen (13) hour course that combines didactic content with interactive discussions.
- Uses case study approach to analyze and integrate psychophysiologic concepts.

May 4 & 11, 2001

Neonatal Resuscitation Plus

- For surgical, emergency, neonatal, pediatric nurses and transport team members.
- Neonatal management and assessment principals.
- Essential pathophysiology components of neonatal conditions.

June 4, 2001
November 12, 2001

In-House Trauma Service Rotation

- Open to active, participating paramedics.
- Opportunity to spend 12-24 hours with the Good Samaritan Hospital Trauma Team and witness trauma resuscitation, operative procedures, formal rounds and clinic.
- CE depending on your department or service.

THE LEVEL 1 TRAUMA CENTER

Good Samaritan Hospital
3815 Highland Avenue
Downers Grove, IL 60515

Phone: 630.275.2400
Fax: 630.275.5566

Direct Transfer Line 1.800.URGENT.5

We're On The Web!
www.level1traumacenter.com